JVC

GR-DVX400EG/EK,DVX407EG,DVX507A/EG/EK,DVX509ED

No. 86672

S40894

JVC

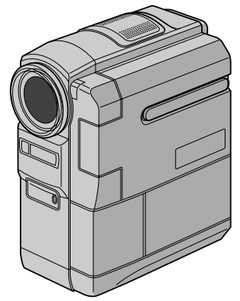
VICTOR COMPANY OF JAPAN, LIMITED
VIDEO DIVISION

JVC

SERVICE MANUAL

DIGITAL VIDEO CAMERA

GR-DVX400EG/EK,DVX407EG, DVX507A/EG/EK,DVX509ED



Mini DV PAL

DSC DIGITAL STILL CAMERA

SPECIFICATIONS *(The specifications shown pertain specifically to the model GR-DVX400,DVX407,DVX507,DVX707)*

Camcorder

For General

Power supply : DC 11.0 V (Using AC Adapter)
DC 7.2 V (Using battery pack)

Power consumption
LCD monitor off, viewfinder on : Approx. 4.5 W (GR-DVX707)/Approx. 3.8 W (GR-DVX507/407/400)
LCD monitor on, viewfinder off : Approx. 5.4 W (GR-DVX707)/Approx. 4.7 W (GR-DVX507/407/400)

Dimensions (W x H x D) : 54 mm x 113.5 mm x 96 mm
(with the LCD monitor closed and the viewfinder pushed back in)

Weight : Approx. 490 g (GR-DVX707/507)
(incl. grip belt)
Approx. 480 g (GR-DVX407/400)
(incl. grip belt)

Operating temperature : 0°C to 40°C

Operating humidity : 35% to 80%

Storage temperature : –20°C to 50°C

Pickup : 1/3.8" CCD (GR-DVX707)
1/4" CCD (GR-DVX507/407/400)

Lens : F 1.8, f = 3.8 mm to 38 mm, 10:1 power zoom lens (GR-DVX707)
F 1.8, f = 3.6 mm to 36 mm, 10:1 power zoom lens (GR-DVX507/407/400)

Filter diameter : ø27 mm

LCD monitor : 2.5" diagonally measured, LCD panel/TFT active matrix system

Viewfinder : Electronic viewfinder with 0.44" black/white LCD

Speaker : Monaural

For Digital Video Camera

Format : DV format (SD mode)

Signal format : PAL standard

Recording/Playback format : Video : Digital component recording
Audio : PCM digital recording, 32 kHz 4-channel (12-bit), 48 kHz 2-channel (16-bit)

Cassette : Mini DV cassette

Tape speed : SP: 18.8 mm/s
LP: 12.5 mm/s

Maximum recording time (using 80 min. cassette) : SP: 80 min.
LP: 120 min.

For Digital Still Camera (GR-DVX707/507 only)

Storage media : SD Memory Card/MultiMediaCard

Compression system : Still image : JPEG (compatible)
Moving image* : MPEG4 (compatible)

File size
Still Image : 3 modes (1280 x 960 pixels*/1024 x 768 pixels/640 x 480 pixels)
Moving Image* : 1 mode (160 x 120 pixels)

Picture quality : 2 modes (FINE/STANDARD)

Approximate number of storable images
: ☞ pg. 50

* GR-DVX707 only

For Connectors

AV
Video output : 1 V (p-p), 75 Ω, analogue
Audio output : 300 mV (rms), 1 kΩ, analogue, stereo

Headphone output (GR-DVX707 only) : Stereo

S-VIDEO : Y: 1 V (p-p), 75 Ω, analogue output
C: 0.29 V (p-p), 75 Ω, analogue output

DV
Input/output (GR-DVX707/507/407 only) : 4-pin, IEEE 1394 compliant
Output (GR-DVX400 only) : 4-pin, IEEE 1394 compliant

USB (GR-DVX707/507 only) : 5-pin

EDIT (GR-DVX707/507 only) : ø3.5 mm, 2-pole

JLIP (GR-DVX407/400 only) : ø3.5 mm, 4-pole

PC (GR-DVX407/400 only) : ø2.5 mm, 3-pole

AC Adapter

For General

Power requirement : AC 110 V to 240 V ∼ , 50 Hz/60 Hz

Output : DC 11.0 V ⎓ , 1.0 A

Specifications shown are for SP mode unless otherwise indicated.
E & O.E. Design and specifications subject to change without notice.

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The following table lists the differing points between Models GR-DVX400EG/EK, DVX407EG, DVX507A/EG/EK and GR-DVX509ED in this serise.

	GR-DVX400EG	GR-DVX400EK	GR-DVX407EG	GR-DVX507A	GR-DVX507EG	GR-DVX507EK	GR-DVX509ED
DV INPUT	NOT USED	NOT USED	USED	USED	USED	USED	USED
EDIT CTL OUTPUT	NOT USED	NOT USED	NOT USED	USED	USED	USED	USED
JLIP TERMINAL	USED	USED	USED	NOT USED	NOT USED	NOT USED	NOT USED
VIDEO FLASH	NOT USED	NOT USED	NOT USED	USED	USED	USED	USED
AC ADAPTER	AP-V12EG	AP-V12EG	AP-V12EG	AP-V12EG	AP-V12EG	AP-V12EG	AP-V12ED
MEMORY CARD	NOT USED	NOT USED	NOT USED	PROVIDED(8MB)	PROVIDED(8MB)	PROVIDED(8MB)	PROVIDED(8MB)
PC CONNECTION CABLE	PROVIDED	PROVIDED	PROVIDED	NOT USED	NOT USED	NOT USED	NOT USED
USB CABLE	NOT USED	NOT USED	NOT USED	PROVIDED	PROVIDED	PROVIDED	PROVIDED
PERI-RCA ADAPTER	PROVIDED	PROVIDED	PROVIDED	NOT USED	PROVIDED	PROVIDED	NOT USED
CONVERSION PLUG	NOT USED	NOT USED	NOT USED	PROVIDED	NOT USED	NOT USED	NOT USED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape 3) Spacers 5) Barrier
   2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

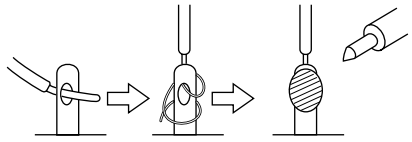


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

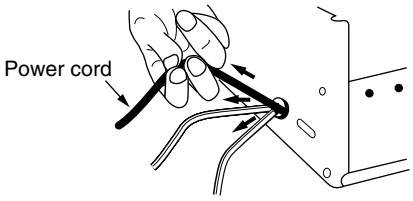


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission.
    Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits.
    Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) Connector part number : E03830-001
    2) Required tool : Connector crimping tool of the proper type which will not damage insulated parts.
    3) Replacement procedure
    (1) Remove the old connector by cutting the wires at a point close to the connector.
    Important : Do not reuse a connector (discard it).

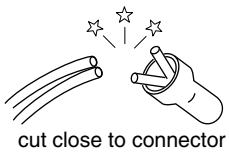


Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

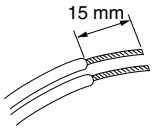


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

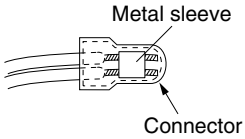


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

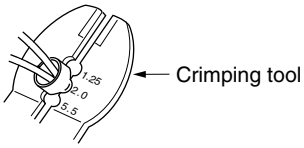


Fig.6

(5) Check the four points noted in Fig.7.

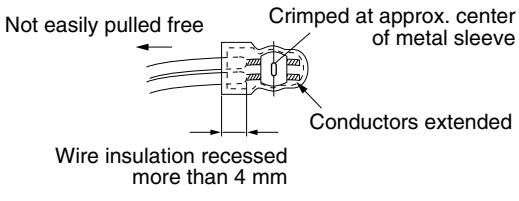

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

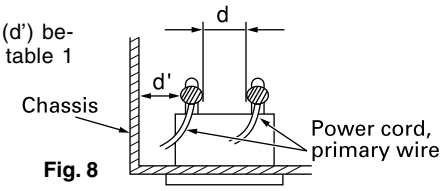


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

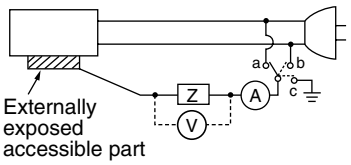


Fig. 9

5. Grounding (Class 1 model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

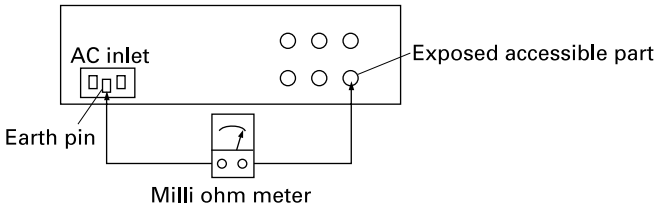


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
DISASSEMBLY

1.1 BEFORE ASSEMBLY AND DISASSEMBLY

1.1.1 Precautions

1. Be sure to remove the power supply unit prior to mounting and soldering of parts.
2. When removing a component part that needs to disconnect the connector and to remove the screw for removing itself, first disconnect the connecting wire from the connector and then remove the screw beforehand.
3. When connecting and disconnecting the connectors, be careful not to damage the wire.
4. Carefully remove and handle the part to which some spacer or shield is attached for reinforcement or insulation.
5. When replacing chip parts (especially IC parts), desolder completely first (to prevent peeling of the pattern).
6. Tighten screws properly during the procedures.
   Unless specified otherwise, tighten screws at a torque of 0.078N•m(0.8kgf•cm).

1.1.2 Assembly and disassembly

STEP No.	PART	Fig.No.	POINT	NOTE
①	FRONT COVER ASSY	Fig.1-3-1, Fig.1-3-2	(S①a), (S①b), 2(S①c), (S①d), (S①e) (Remove screw No.1 – 6)	NOTE① a NOTE① b NOTE① c
(1)	(2)	(3)	(4)	(5)

(1) Indicate the disassembly steps. When assembling, perform in the reverse order of these steps. This number corresponds to the number in the disassembly diagram.

(2) Indicates the name of disassembly/assembly parts.

(3) Indicates the number in the disassembly diagram.

(4) Indicates parts and points such as screws, washers, springs which must be removed during disassembly/assembly.

Symbol	Name, Point
S	Screw
L	Lock, Pawl, Hook
SD	Soldering
☆(Others)	Connector, Cover, Bracket, etc.

(Example)
- 2 (S①) : Remove the two screws (S①) for removing the part ①.
- CN ①a: Disconnect the connector ①a.
- SD ① : Unsolder at the point SD ①.

(5) Precautions on disassembly/assembly.

1.1.3 Destination of connectors

Note: *Three kinds of double-arrows in connection tables respectively show kinds of connector/wires.*
↔ : Wire
⇔ : Flat wire (FPC, FFC)
⬌ : Board to Board connector

[Example]

CONN. No.	CONNECTOR					Pin No.
CN②a	MAIN	CN103	⬌	JACK	CN501	60
CN②b	MAIN	CN104	⇔	MONITOR	CN761	45/39

1.1.4 Disconnection of connectors (Wires)

Connector
Pull both ends of the connector in the arrow direction, remove the lock and disconnect the flat wire.

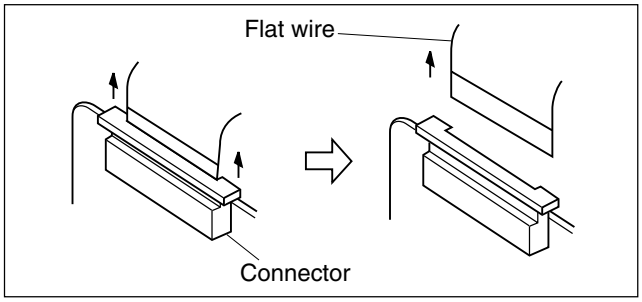


Fig. 1-1-1 Connector 1

Extend the locks in the direction of the arrow for unlocking and then pull out the wire. After removing the wire, immediately restore the locks to their original positions because the locks are apt to come off the connector.

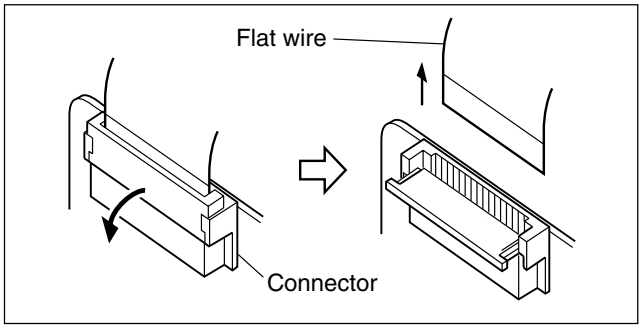


Fig. 1-1-2 Connector 2

B-B connector
Pull the board by both the sides in the direction of the arrow for disconnecting the B-B connector.

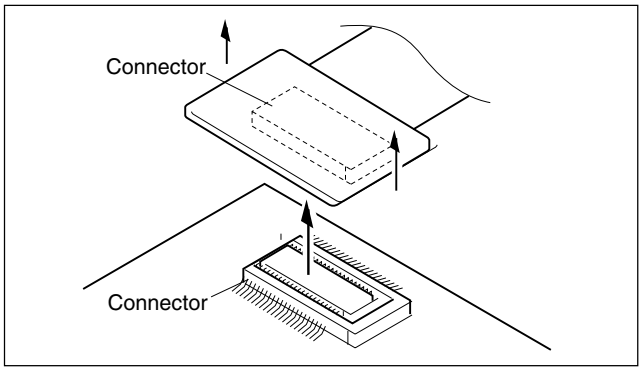


Fig. 1-1-3 Connector 3

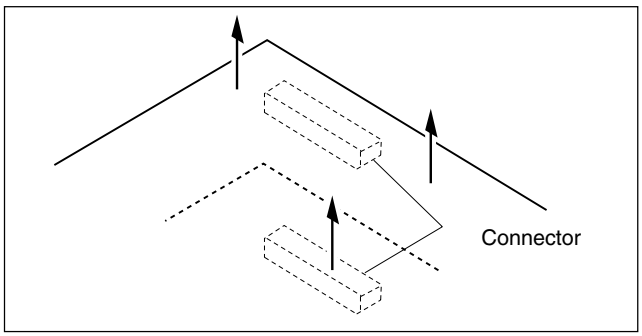


Fig. 1-1-4 Connector 4

1.2 JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT

1.2.1 Tools required for adjustments

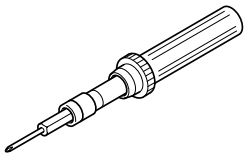
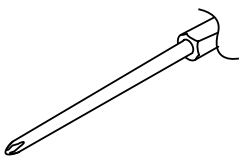
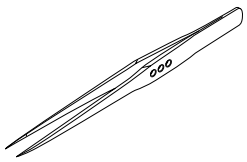
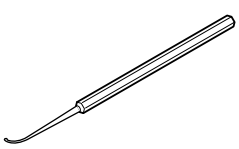
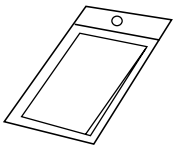
1 Torque driver YTU94088	2 Bit YTU94088-003
	
3 Tweezers P-895	4 Chip IC replacement jig PTS40844-2
	
5 Cleaning cloth KSMM-01	
	

Table 1-2-1

1. **Torque driver**
   Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.
2. **Bit**
   This bit is slightly longer than those set in conventional torque drivers.
3. **Tweezers**
   To be used for removing and installing parts and wires.
4. **Chip IC replacement jig**
   To be used for adjustment of the camera system.
5. **Cleaning cloth**
   Recommended cleaning cloth to wipe down the video heads, mechanism (tape transport system), optical lens surface.

1.3 DISASSEMBLY/ASSEMBLY OF CABINET PARTS AND BOARD ASSEMBLY

1.3.1 Disassembly flow chart

This flowchart indicates the disassembly step for the cabinet parts and board assembly in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order.

①	FRONT COVER ASSY
② / ③ / ④	UPPER CASE ASSY (Incl MONITOR ASSY) COVER (DV) COVER (JACK)
⑤	MONITOR ASSY
⑥	TOP COVER ASSY (Incl MIC UNIT)
⑦	LOWER CASE ASSY (Incl OP BLOCK ASSY / E.VF ASSY)
⑧	OP BLOCK ASSY
⑨	OP BRACKET
⑩	E.VF ASSY
⑪	AUDIO BOARD ASSY
⑫	MDA BOARD ASSY
⑬	MAIN BOARD ASSY
⑭	MECHANISM ASSY

Table 1-3-1

1.3.2 Disassembly method

STEP No.	PART	Fig.No.	POINT	NOTE
①	FRONT COVER ASSY	Fig.1-3-1, Fig.1-3-2	(S①a), (S①b), 2(S①c), (S①d), (S①e) (Remove screw No.1 – 6)	NOTE① a NOTE① b NOTE① c
② / ③ / ④	UPPER CASE ASSY (Incl MONITOR ASSY) / COVER (DV) / COVER (JACK)		(S②a), (S②b), (S②c), 2(S②d), (S②e), (S②f), CN②a, CN②b (Remove screw No.7 – 13)	NOTE②
⑤	MONITOR ASSY	Fig.1-3-2	2(S⑤) (Remove screw No.14 – 15)	NOTE⑤
⑥	TOP COVER ASSY (Incl MIC UNIT)	Fig.1-3-1	(S⑥a), (S⑥b), (L⑥), CN⑥ (Remove screw No.16 – 17)	
⑦	LOWER CASE ASSY (Incl OP BLOCK ASSY / E.VF ASSY)		5(S⑦), CN⑦a, CN⑦b, CN⑦c, CN⑦d (Remove screw No.18 – 22)	
⑧	OP BLOCK ASSY		2(S⑧), 2(L⑧) (Remove screw No.23 – 24)	NOTE⑧
⑨	OP BRACKET		(S⑨) (Remove screw No.25)	
⑩	E.VF ASSY		(S⑩), CN⑩ (Remove screw No.26)	
⑪	AUDIO BOARD ASSY		3(S⑪) (Remove screw No.27 – 29)	
⑫	MDA BOARD ASSY		(S⑫a), (S⑫b), CN⑫a, CN⑫b, CN⑫c, CN⑫d, CN⑫e (Remove screw No.30 – 31)	
⑬	MAIN BOARD ASSY		(S⑬), CN⑬a, CN⑬b (Remove screw No.32)	
⑭	MECHANISM ASSY		(S⑭a), 2(S⑭b), BRACKET(MECHA) (Remove screw No.33 – 35)	

Table 1-3-2

NOTE ①a: *Open the Monitor to remove the screws 3 and 4.*

NOTE ①b: *Open the Cover (DV) to remove the screw 2 located inside of Cover (DV).*

NOTE ①c: *Open the Cover (JACK) to remove the Front Cover assembly.*

NOTE ②: *Remove the Upper Case assembly to remove the Monitor.*

NOTE ⑤: *Refer to Fig. 1-4-1 for the disassembly methob.*

NOTE ⑧: *Refer to Fig. 1-5-1 for the disassembly methob.*

Note: *Remove the parts marked in* .

CONN. No.	CONNECTOR					Pin No.
CN②a	MAIN	CN103	⬌	JACK	CN501	60
CN②b	MAIN	CN104	⇔	MONITOR	CN761	45/39
CN⑥	AUDIO	CN803	↔	MIC UNIT	—	4
CN⑦a	MAIN	CN101	⬌	AUDIO	CN801	60
CN⑦b	MAIN	CN107	⇔	CCD	—	20
CN⑦c	MAIN	CN108	⇔	OP BLOCK ASSY	—	24
CN⑦d	MDA	CN206	⇔	CAMERA OPE UNIT	—	14
CN⑩	AUDIO	CN802	⇔	E.VF ASSY	CN701	20
CN⑫a	MDA	CN201	⇔	LOADING MOTOR	—	6
CN⑫b	MDA	CN202	⇔	DRUM MOTOR	—	11
CN⑫c	MDA	CN205	⬌	MAIN	CN102	60
CN⑫d	MDA	CN203	⇔	CAPSTAN MOTOR	—	18
CN⑫e	MDA	CN204	⇔	SENSOR	—	15
CN⑬a	MAIN	CN110	⇔	HEAD	—	8
CN⑬b	MAIN	CN106	⇔	ROTARY ENCODER	—	6

Table 1-3-3

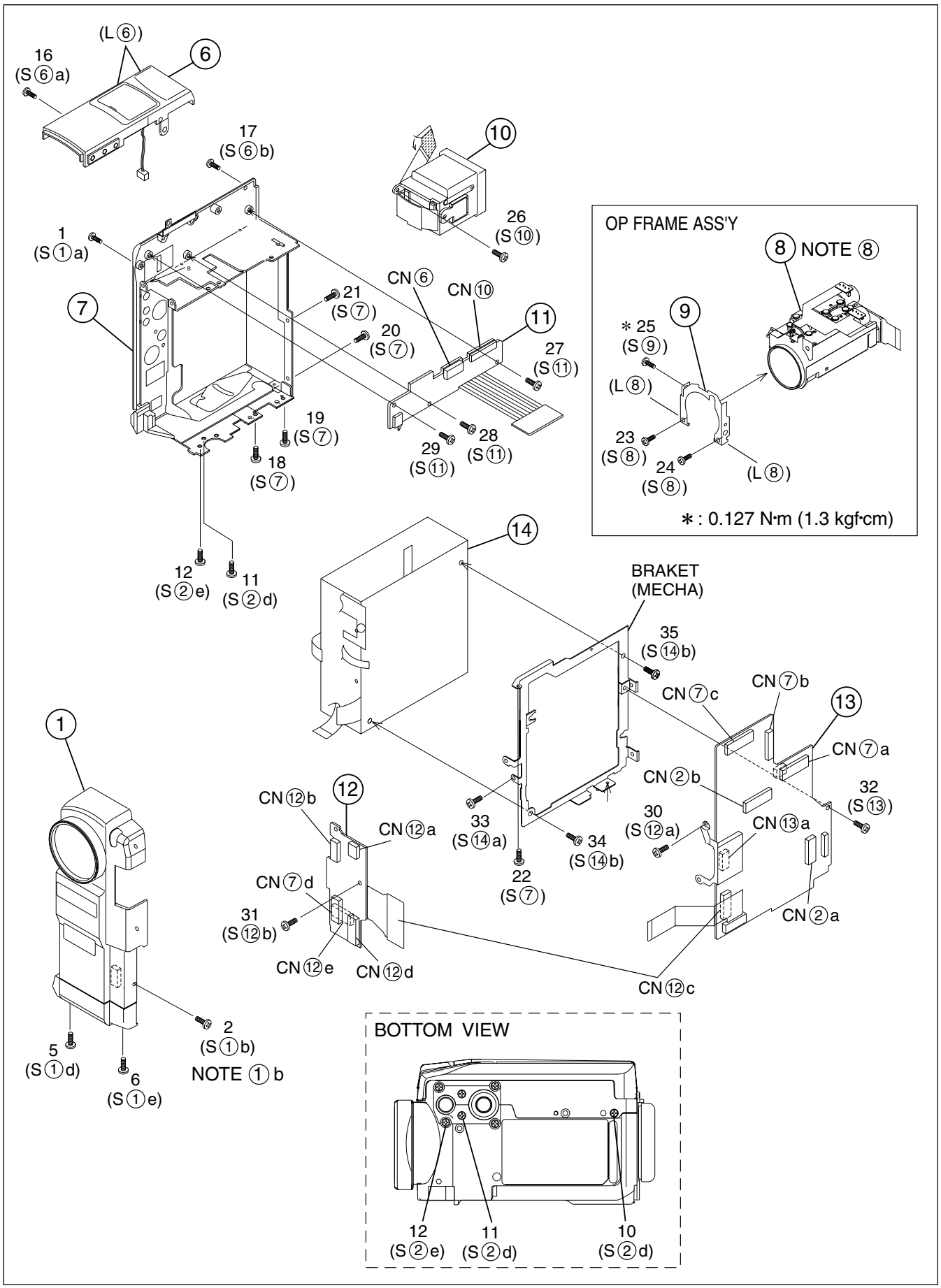

(L ⑥)
16
(S ⑥a)
6
17
(S ⑥b)
10
26
(S ⑩)
1
(S ①a)
7
21
(S ⑦)
20
(S ⑦)
CN ⑥
CN ⑩
11
27
(S ⑪)
19
(S ⑦)
18
(S ⑦)
29
(S ⑪)
28
(S ⑪)
12
(S ②e)
11
(S ②d)
OP FRAME ASS'Y
8
NOTE ⑧
9
* 25
(S ⑨)
(L ⑧)
23
(S ⑧)
24
(S ⑧)
(L ⑧)
* : 0.127 N·m (1.3 kgf·cm)
14
BRAKET
(MECHA)
35
(S ⑭b)
CN ⑦c
CN ⑦b
13
CN ⑦a
CN ②b
32
(S ⑬)
1
CN ⑫b
12
CN ⑫a
33
(S ⑭a)
34
(S ⑭b)
30
(S ⑫a)
CN ⑬a
22
(S ⑦)
CN ⑦d
31
(S ⑫b)
CN ⑫e
CN ⑫d
CN ②a
CN ⑫c
2
(S ①b)
NOTE ① b
5
(S ①d)
6
(S ①e)
BOTTOM VIEW
12
(S ②e)
11
(S ②d)
10
(S ②d)

Fig. 1-3-1

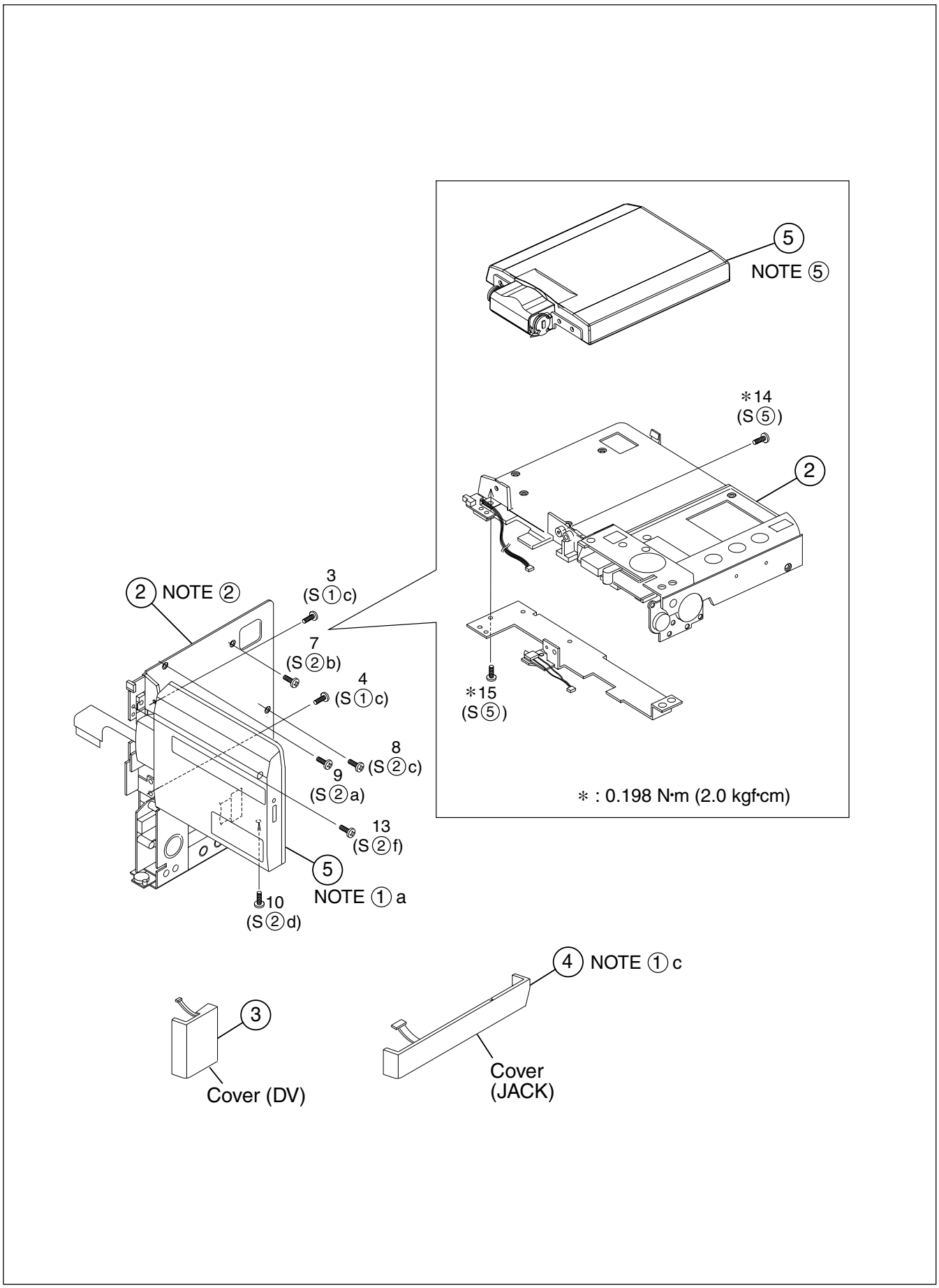

5
NOTE ⑤
＊14
(S⑤)
2
＊15
(S⑤)
＊ : 0.198 N·m (2.0 kgf·cm)
2 NOTE ②
3
(S①c)
7
(S②b)
4
(S①c)
8
(S②c)
9
(S②a)
13
(S②f)
5
NOTE ① a
10
(S②d)
4 NOTE ① c
3
Cover (DV)
Cover
(JACK)

Fig. 1-3-2

1.4 DISASSEMBLY OF ⑤ MONITOR ASSEMBLY

1.4.1 ⑤ Monitor assembly/Hinge assembly

1. Remove the four screws (1-4). While opening the monitor cover assembly as shown by the arrow, release the three hooks (L⑤a, L⑤b, L⑤c) from engagement and remove the monitor cover assembly.
2. Remove the parts out of the monitor case and unlock the connector CN⑤a. While raising the hinge assembly upwards, get the two hooks (L⑤c, L⑤d) disengaged and disconnect the FPC by pulling it out. Then, remove the hinge assembly.

Note⑤a: *When removing the parts out of the monitor case assembly, be very careful not to damage the FPC and parts.*

3. Disconnect FPC from the connector CN⑤b and hook (L⑤e) then remove the MONITOR board assembly and backlight.

Note⑤b: *Remove the MONITOR board assembly and backlight together unless it is needed to separate them from each other for part replacement, etc., because the two are soldered to each other.*

4. Remove the LCD module.

1.4.2 Hinge assembly

1. Remove the two screws (5, 6). While releasing the two hooks (L⑤f, L⑤g) from engagement, remove the hinge cover (U).

Note⑤c: *Be careful not to lose any part during the above-mentioned process.*

2. Draw the FPC assembly out of the hinge cover (L) and then remove the FPC assembly from the hinge assembly.

Note⑤d: *When reassembling, wind the FPC assembly around the hinge assembly by three turns and a half.*

Be careful not to break the FPC wire during the work.

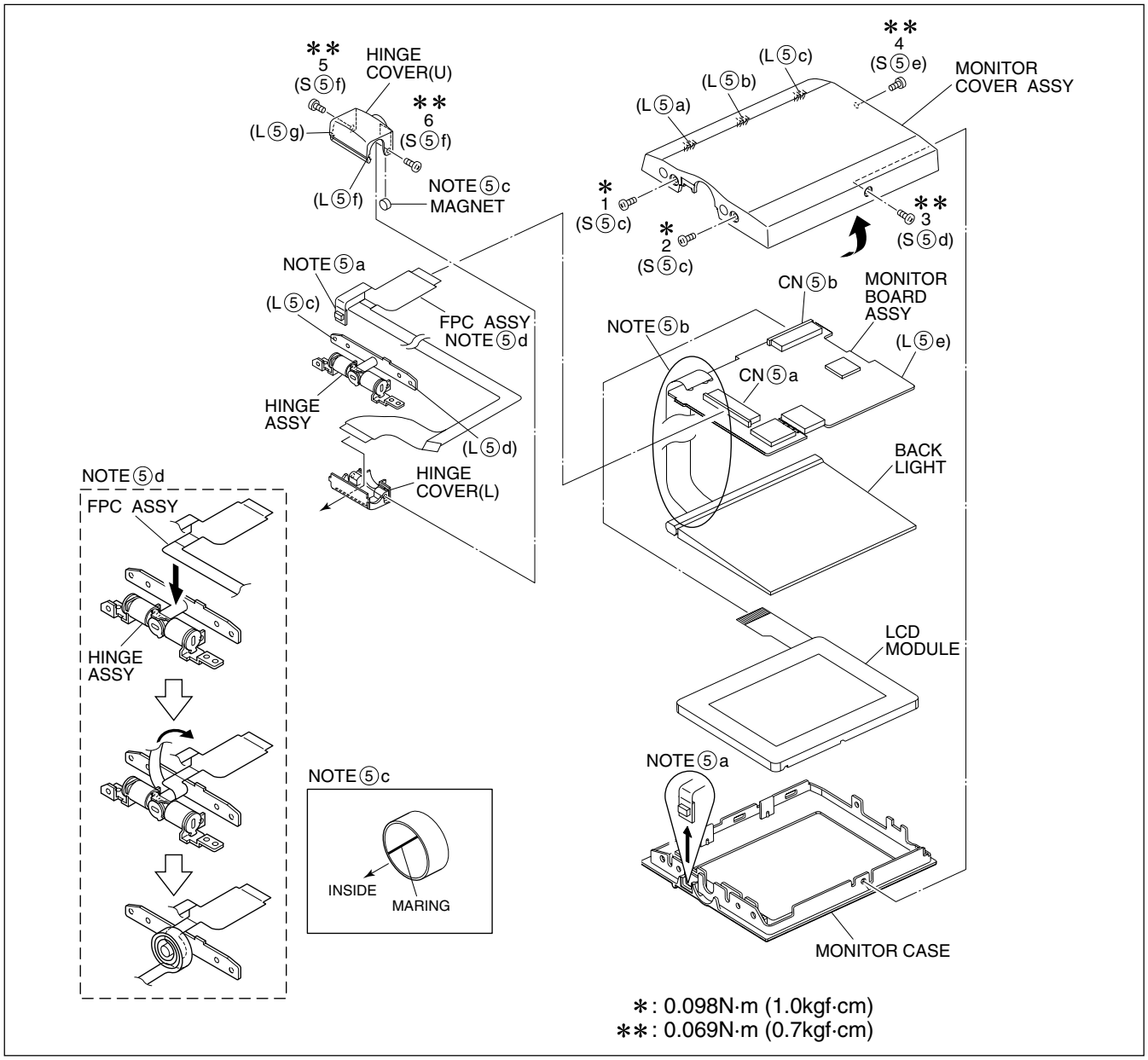


Fig. 1-4-1

1.5 DISASSEMBLY OF ⑧ OP BLOCK ASSEMBLY/CCD BOARD ASSEMBLY

1.5.1 Precautions

1. Carefully handle the CCD image sensor, optical LPF, lens, etc. during the disassembly work. Pay the most careful attention to the surface of those parts not to get it soiled, scratched or dusty. If some of those surfaces gets soiled with fingerprints, etc., wipe it out with silicone paper, clean chamois, cleaning cloth or the like.
2. The new CCD image sensor is occasionally shipped from the factory as a protection seal is applied onto its transparent glass. If so, leave the protection seal as it is and remove it just before installing the CCD image sensor in the OP block assembly.

1.5.2 How to remove OP block assembly and CCD board assembly

1. Unsolder at the fourteen points (SD⑧) and remove the CCD board assembly.
2. Remove the two screws (1, 2) and then remove the CCD base assembly.

Note⑧a: *Carefully remove the CCD base assembly, because the space rubber and optical LPF may be removed together with the CCD image sensor.*

Note⑧b: *When replacing the CCD image sensor, don't replace it individually but replace the CCD base assembly in whole with a new one.*

1.5.3 How to install OP block assembly and CCD board assembly

1. Install the optical LPF with the space rubber fitted to its CCD side in the OP block assembly.
2. Paying heed to the space rubber not to get it to come off the setting position, install the CCD base assembly in place and fasten it together with the space rubber with the two screws (1, 2).
3. Set the CCD board assembly in the CCD base assembly, and fasten it by soldering at the fourteen points (SD⑧).

1.5.4 Replacement of service parts

Service parts to be supplied for the OP block assembly are as follows.
When replacing a part, be very careful not to get the FPC wire broken or damaged by soldering (overheating).

1. Focus motor
2. Zoom motor
3. Iris motor unit

Note⑧c: *When soldering the FPC wire of the focus motor or zoom motor during the replacement work, be sure to keep the tip of a soldering iron approximately 1 mm above the terminal.*

Note⑧d: *The iris motor unit includes one FPC assembly and two sensors.*

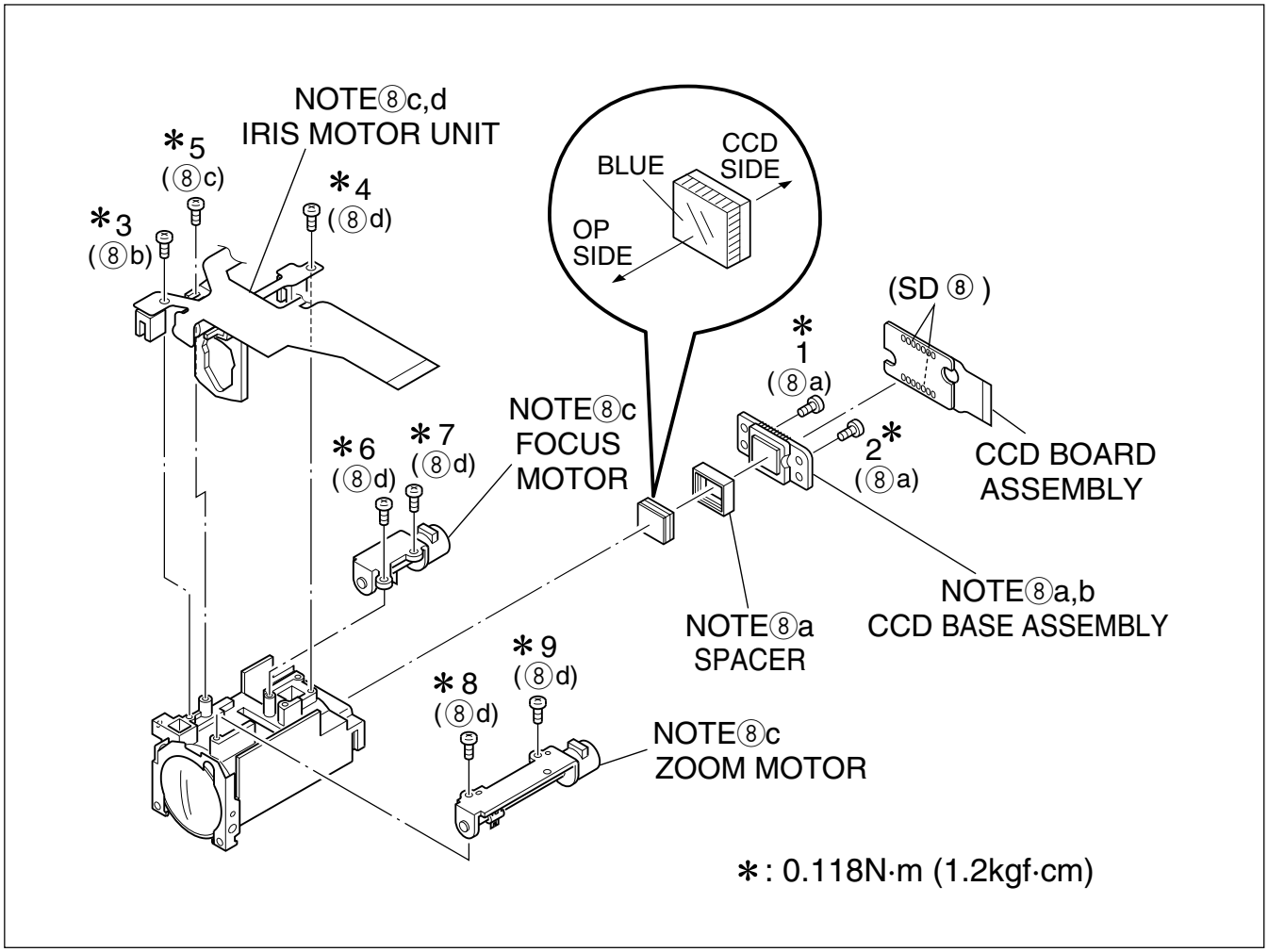


Fig. 1-5-1

1.6 DISASSEMBLY OF ⑩ E. VF ASSEMBLY

1.6.1 ⑩E. VF assembly

Note⑩a: *Be very careful not to get the inside of the VF soiled or dusty during and after disassembling the E.VF assembly.*

1. Remove the three screws (1 to 3) to remove bracket assy and bracket assy(L) and then pull out the holder(VF).
2. Remove the screw (4) and get the hook (L⑩) disengaged and the remove the case(VF) and pull out the tube(VF).

   Note⑩b: *Be careful not to lose the KNOB(VF).*
3. Remove the EYE CUP.
4. Remove the lens assy and pull out the case(VF).

   Note⑩c: *Be careful not to lose the spring(LENS).*
5. Remove the two screws (5,6) to remove holder(LCD) and pull out the holder(VF).

   Note⑩d: *Pay need the parts not to damage anything.*

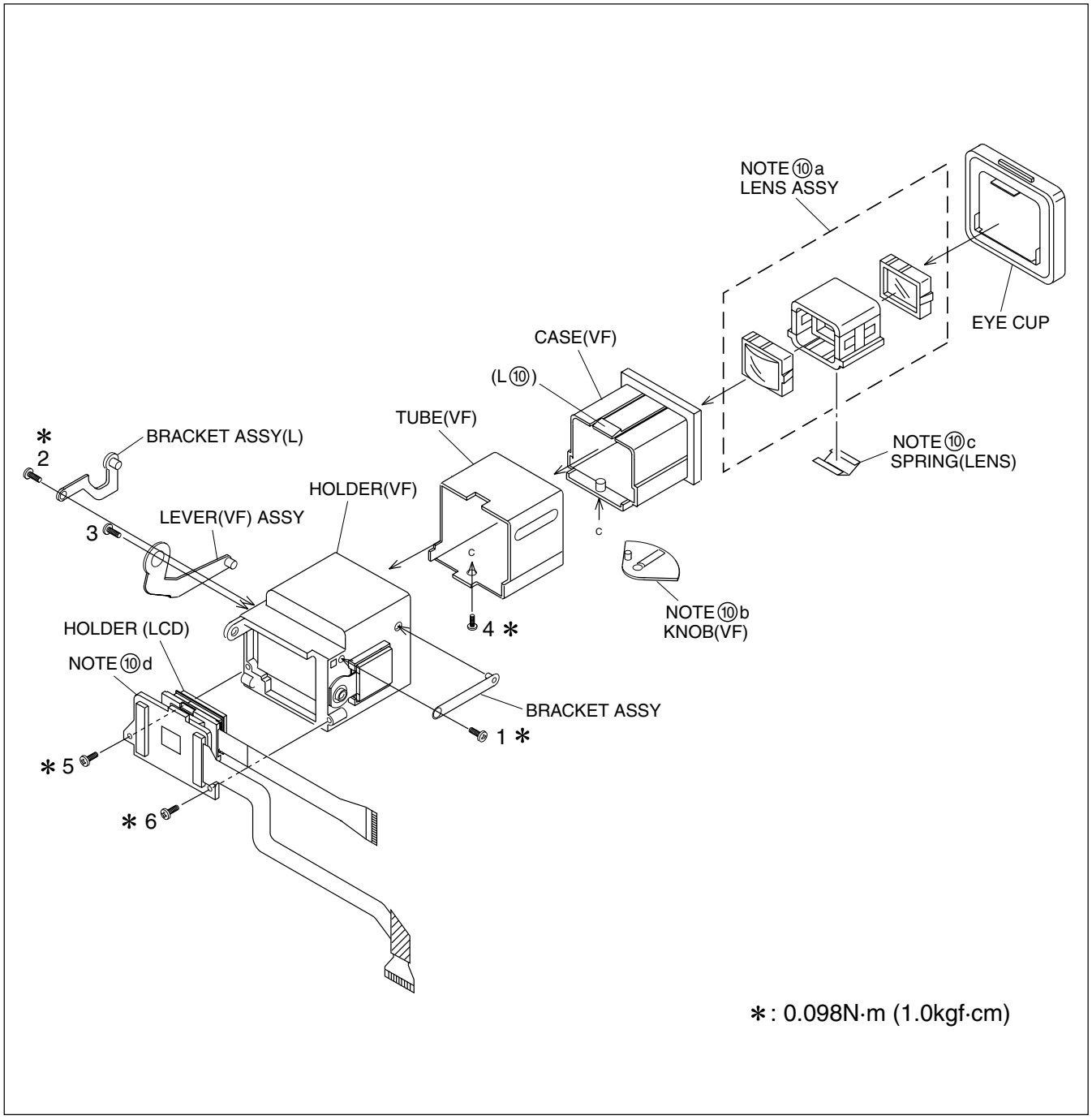


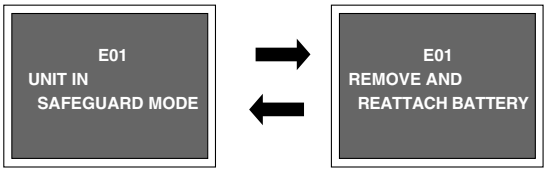
Fig. 1-6-1

1.7 EMERGENCY DISPLAY

Whenever some abnormal signal is input to the syscon CPU, an error number (E01, as an example) is displayed on the LCD monitor or (in the electronic view finder).
In every error status, such the message as shown below alternately appear over and over.

- In an emergency mode, all operations except turning on/off the POWER switch are ineffectual.

Example (in case of the error number E01):



LCD display	Emergency mode	Details	Possible cause
E01	LOADING	In the case the encoder position is not shifted to the next point though the loading motor has rotated in the loading direction for 4 seconds or more. This error is defined as [E01].	1. The mechanism is locked during mode shift. 2. The mechanism is locked at the mechanism loading end, because the encoder position is skipped during mechanism mode shift. 3. No power is supplied to the loading MDA.
E02	UNLOADING	In the case the encoder position is not shifted to the next point though the loading motor has rotated in the unloading direction for 4 seconds or more. This error is defined as [E02].	1. The mechanism is locked during mode shift. 2. The mechanism is locked at the mechanism loading end, because the encoder position is skipped during mechanism mode shift.
E03	TU & SUP REEL FG	In the case no REEL FG is produced for 4 seconds or more in the capstan rotation mode after loading was complete, the mechanism mode is shifted to STOP with the pinch roller set off. This error is defined as [E03]. However, no REEL EMG is detected in the SLOW/STILL mode.	1. The idler gear does not engage with the reel disk well. 2. Though the idler gear and reel disk are engaged with each other, the tape is not wound because of overload to the mechanism. 3. No FG pulse is output from the reel sensor. 4. No power is supplied to the reel sensor. 5. Tape transport operation takes place with a cassette having no tape inside. 6. The tape slackens and no pulse is produced until the slack is taken up and the tape comes into the normal status.
E04	DRUM FG	In the case there is no DRUM FG input in the drum rotation mode for 4 seconds or more. This error is defined as [E04], and the mechanism mode is shifted to STOP with the pinch roller set off.	1. The drum cannot be started or drum rotation is stopped because tape transport load is too high. 1) Tape tension is extremely high. 2) The tape is damaged or soiled with grease, etc. 2. The DRUM FG signal is not received by the syscon CPU. 1) Disconnection in the middle of the signal line. 2) Failure of the DRUM FG pulse generator (hall element). 3. No drum control voltage is supplied to the MDA. 4. No power is supplied to the DRUM MDA.
E05	–	–	–
E06	CAPSTAN FG	In the case no CAPSTAN FG is produced in the capstan rotation mode for 2 seconds or more. This error is defined as [E06], and the mechanism mode is shifted to STOP with the pinch roller set off. However, no CAPSTAN EMG is detected in the STILL/FF/REW mode.	1. The CAPSTAN FG signal is not received by the syscon CPU. 1) Disconnection in the middle of the signal line. 2) Failure of the CAPSTAN FG pulse generator (MR element). 2. No capstan control voltage is supplied to the MDA. 3. No power is supplied to the CAPSTAN MDA. 4. The capstan cannot be started or capstan rotation is stopped because tape transport load is too high. 1) Tape tension is extremely high. (Mechanical locking) 2) The tape is damaged or soiled with grease, etc. (Tape tangling occurs, etc.)

(DVC_03)

Table 1-7-1

Symbol No. →	①						② / ③ / ④							⑤		⑥	
Removing order of screw →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Place to stick screw →	✻				✻								✻	✻	✻	✻	
Reference drawing →	Fig. 1-3-1, 1-3-2						Fig. 1-3-1, 1-3-2							Fig. 1-3-2		Fig. 1-3-1	
Screw tightening torque →	I													Ⅳ		I	

Symbol No. →	⑦					⑧		⑨	⑩	⑪			⑫		⑬	⑭		
Removing order of screw →	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Place to stick screw →	✻	✻	✻	✻	✻	✻	✻							✻				
Reference drawing →	Fig. 1-3-1					Fig. 1-3-1		Fig. 1-3-1	Fig. 1-3-1	Fig. 1-3-1			Fig. 1-3-1		Fig. 1-3-1	Fig. 1-3-1		
Screw tightening torque →	I					I		V	I									

⑤ MONITOR ASSY						
Removing order of screw →	1	2	3	4	5	6
Place to stick screw →	✻	✻				
Reference drawing →	Fig. 1-4-1					
Screw tightening torque →	Ⅲ		VI			

⑧ OP BLOCK ASSY								
Removing order of screw →	1	2	3	4	5	6	7	8	9
Place to stick screw →									
Reference drawing →	Fig. 1-5-1								
Screw tightening torque →	II								

⑩ E. VF ASSY						
Removing order of screw →	1	2	3	4	5	6
Place to stick screw →						
Reference drawing →	Fig. 1-6-1					
Screw tightening torque →	Ⅲ		I		Ⅲ	

< NOTE >

1) ✻ : Don't reuse the screw, because screw lock bond was applied to them.
2) Pay careful attention to tightening torque for each screw.

I : 0.078N·m (0.8kgf·cm) II : 0.118N·m (1.2kgf·cm) Ⅲ : 0.098N·m (1.0kgf·cm)
Ⅳ : 0.198N·m (2.0kgf·cm) V : 0.127N·m (1.3kgf·cm) Ⅵ : 0.069N·m (0.7kgf·cm)

Table 1-8-1

1.9 HOW TO TAKE OUT CASSETTE TAPE MANUALLY

1.9.1 How to remove cassette tape manually from the set

If the cassette tape is not ejected from the cassette housing because of some electric trouble, it can be removed from the set by the temporary measure that is to turn the loading motor forcibly as mentioned below.
Through the removing work, pay heed to the exterior parts such as the covers, etc. as well as to the cassette tape to get nothing damaged.

<Procedure>

1. Disconnect the power supply (battery or DC cord) from the set.
2. Disconnect the cover (ADJ) from the lower case.
3. Open the front cover.
4. Supply 3 V DC to the terminals (electrodes) on the top of the loading motor to slide the slide deck assembly to the front side, and stop the power supply when both the pole bases are positioned in the unloading status inside the tape. Since the tape remains as it is not wound up at that time, pay careful attention to the tape not to damage it and not to soil it with grease, etc.
   If unloading operation is continued after both the pole bases return to their respective positions inside the tape, the mechanism enters the eject mode and the cassette housing assembly is lifted up. If it occures, the pulled out tape may be caught in the cassette lid and the tape may be resultingly damaged.
5. Turn the center gear assembly with a sharp-pointed thing (chip IC replacing jig, etc.) in the direction of the arrow to wind up the tape. Carefully turn the center gear assembly not to damage the tape.
   If the tape cannot be wound up by turning the center gear assembly, it is thinkable that the idler arm assembly is positioned not to engage with the reel disk assembly. If so, shift the mechanism mode so that the idler arm assembly is correctly engaged with the reel disk assembly. After fine adjusting the engagement, try to wond up the tape is the same manner once more.
   In such the event, it is recommended to shift the idler arm assembly slightly in the loading direction.
6. After confirming that the tape is completely wound up, proceed with unloading operation until the mechanism enters the eject mode. Then, take the cassette tape out of the cassette housing.
7. After removing the cassette tape, check to see if the manually wound part of the tape is not soiled with grease, etc. At the same time, check the mechanism assembly, particularly the tape transport system, whether there is something abnormal or not.

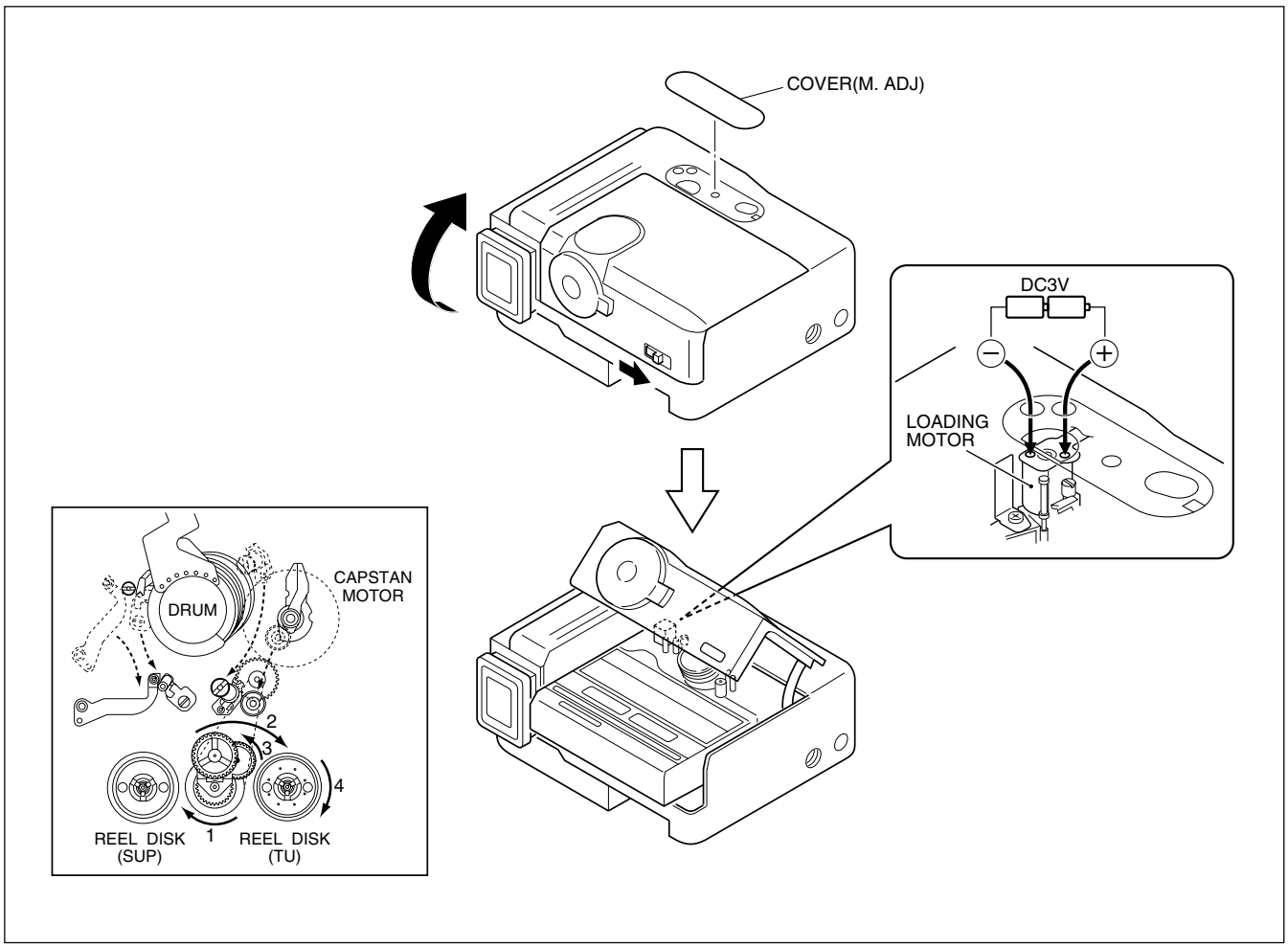


Fig. 1-9-1

SECTION 2
MECHANISM ADJUSTMENT

2.1 PRELIMINARY REMARKS ON ADJUSTMENT AND REPAIR

2.1.1 Precautions

1. When fastening parts, pay careful attention to the tightening torque of each screw. Unless otherwise specified, tighten a screw with the torque of 0.039 N•m (0.4 kgf•cm).
2. Be sure to disconnect the set from the power supply before fastening and soldering parts.
3. When disconnecting/connecting wires, be careful not to get them and their connectors damaged. (Refer to the Section 1.)
4. When replacing parts, be very careful neither to damage other parts nor to fit wrong parts by mistake.

2.1.2 Notes on procedure for disassemby/assembly

The disassembling procedure table (Table 2-4-1 on page 2-6,a part of the table is shown below for reference)shows the procedure to disassemble/reassemble mechanism parts.
Carefully read the following explanation before starting actual disassembling/reassembling work. The item numbers (circled numbers)in the following explanation correspond to those appearing under respective columns of the table.

(1) Circled numbers appearing in this column indicate the order to remove parts. When reassembling, follow these numbers in the reverse order. Circled numbers in this column correspond to those appearing in drawings of this section.

(2) This column shows part names corresponding to circled numbers in the left column.

(3) The symbol (T or B)appearing in this column shows the side which the objective part is mounted on.
T =the upper side, B =the lower side

(4) Symbols appearing in this column indicate drawing numbers.
Step Part Name Fig. Point Note Remarks

(5) This column indicates parts and points such as screws, washers,springs,and others to be removed/fitted for disassembling/reassembling the mechanism. Besides such the parts, this column occasionally indicates working points.

P = Spring
W = Washer
S = Screw
* = Lock (L),soldering (SD),shield,connector (CN), etc.

Example
- Remove ((W1)=Washer W1.
- **Remove the solder at (SD1)=Point SD1.
- **Disconnect Ⓐ =Connector Ⓐ .

(6) Numbers in this column represent the numbers of notes in the text.For example, “1” means “Note 1”.
(For parts that need phase adjustment after reassembling, refer to “2.6 MECHANISM ADJUSTMENTS”.)

(7) This column indicates required after-disassembling/-reassembling work such as phase adjustment or mechanism adjustment.

NO.	PART NAME		FIG.	POINT	NOTE	REMARKS
Ⓐ	Cassette housing assembly	T	Fig. 2-4-5	3(S1),(L1a)-(L1d)	1a, 1b, 1c, 1d	Adjustment
2a	Reel disk (SUP) assembly	T	Fig. 2-4-6	(W2)	2a, 2b	
2b	Reel disk (TU) assembly	T		(W2)	2a, 2b	
2c	Reel cover assembly	T		2(S2a),(S2b),(W2)	2d	
3a	Tension arm assembly	T	Fig. 2-4-7	(W3a)	3b	
3b	Release guide assembly	T		-	3a	
3c	Idler arm assembly	T		(W3b)	-	
3d	Guide arm assembly	T		-	3a	
3e	Pinch roller arm assembly	T		(W3a)	-	
4a	Cleaner arm assembly	T	Fig. 2-4-8	(L4a)	4a	
4b	Slant pole arm assembly	T		(W4),(L4b),(P4a),(P4b)	4b	
4c	Drum assembly	T		3(S4)	-	
5a	Guide roller (S) assembly	T	Fig. 2-4-9	(P5)	5a, 5b	
5b	Rail assembly	T		3(W5a), (W5b)	5c	

(1) (2) (3) (4) (5) (6) (7)

2.2 JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT

2.2.1 Tools required for adjustments

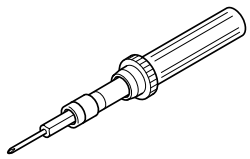
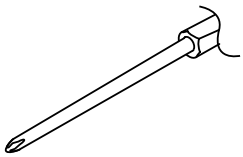
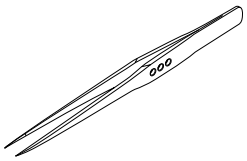
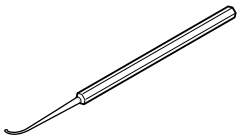
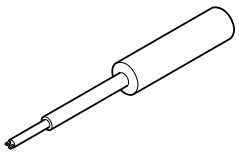
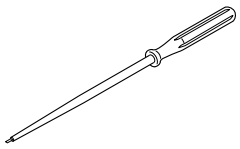
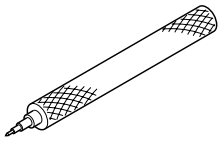
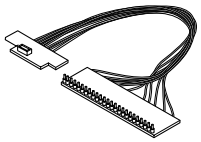
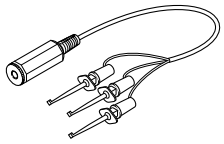
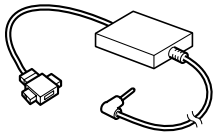
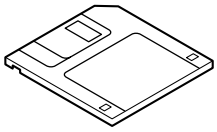
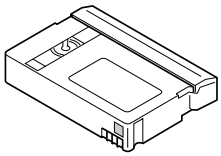
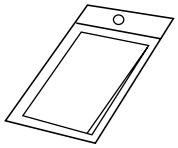
1 Torque driver YTU94088	2 Bit YTU94088-003
	
3 Tweezers P-895	4 Chip IC Replacement Jig PTS40844-2
	
5 Guide driver YTU94148A	6 Adjustment driver YTU94028
	
7 Slit washer installation jig YTU94121A	8 Jig connector cable YTU93106C
	
9 Extension connector YTU94145D-40	10 Communication cable YTU93107A
	
11 PC cable QAM0099-002	12 Service support system YTU94057-59
	
13 Alignment tape MC-2	14 Cleaning cloth KSMM-01
	

Table 2-2-1

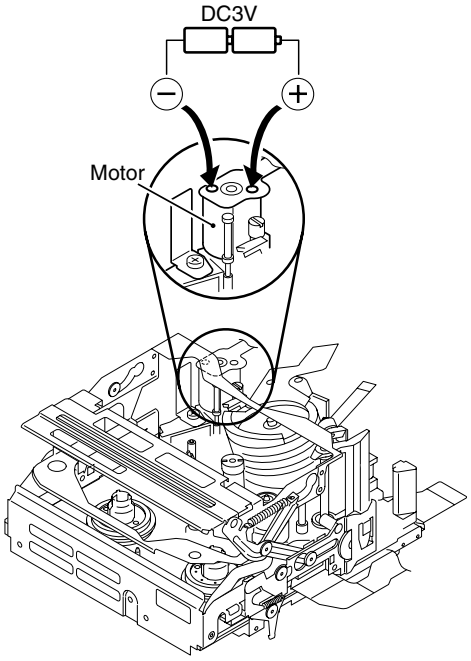
1. **Torque driver**
   Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.
2. **Bit**
   This bit is slightly longer than those set in conventional torque drivers.
3. **Tweezers**
   To be used for removing and installing parts and wires.
4. **Chip IC replacement jig**
   To be used for adjustment of the camera system.
5. **Guide driver**
   To be used to turn the guide roller to adjustment of the linarity of playback envelope.
6. **Adjustment driver**
   To be used for adjustment.
7. **Slit washer installation jig**
   To be used to install slit washers.
8. **Jig connector cable**
   Connected to CN105 of the main board and used for electrical adjustment, etc.
9. **Extension connector**
   Connect this extension connector to the connector of the Jig connector cable for extending the cable connector.
   Note: *For supplying the power through the coupler by removing the cover (for Jig), use this extension connector double for connecting the Jig connector cable.*
10. **Communication cable**
    Connect the Communication cable between the PC cable and Jig connector cable when performing a PC adjustment.
11. **PC cable**
    To be used to connect the VideoMovie and a personal computer with each other when a personal computer is used for adjustment.
12. **Service support system**
    To be used for adjustment with a personal computer.
13. **Alignment tape**
    To be used for check and adjustment of interchangeability of the mechanism.
14. **Cleaning cloth**
    Recommended cleaning cloth to wipe down the video heads, mechanism (tape transport system), optical lens surface.

2.3 DISASSEMBLY/ASSEMBLY OF MECHANISM ASSEMBLY

2.3.1 General statement

The mechanism should generally be disassembled/assembled in the EJECT mode (ASSEMBLY mode). (Refer to Fig. 2-3-1.)
However, when the mechanism is removed from the main body, it is set in the STOP mode. Therefore, after the mechanism is removed from the main body, supply 3 V DC to the electrode on the top of the loading motor to enter the mechanism mode into the EJECT mode compulsory.

<Mechanism assembly/Cassette housing assembly>



<Back side of the mechanism assembly>

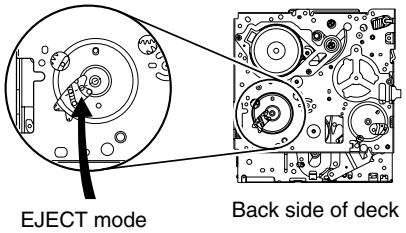


Fig. 2-3-1

2.3.2 Explanation of mechanism mode

The mechanism mode of this model is classified into six modes as shown in Table 2-3-1. Each mechanism mode can be distinguished from others by the relative position of "○" mark on the sub cam gear to the inner or outer protrusion on the main deck.
Refer to Fig. 2-3-2 to 2-3-8 below.
The EJECT mode, C IN mode and SHORT FF mode should be recognized by the relative position of the "○" mark to the inner protrusion, while the STOP mode, REV mode and PLAY mode should be recognized by that to the outer protrusion.

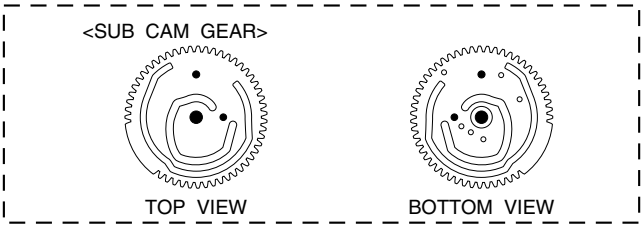


Fig. 2-3-2

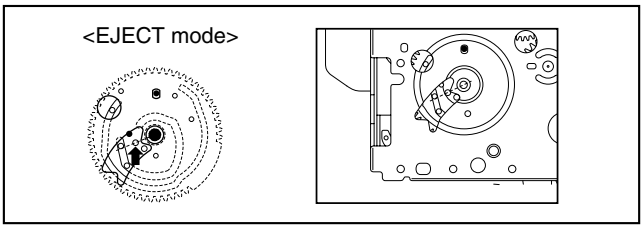


Fig. 2-3-3

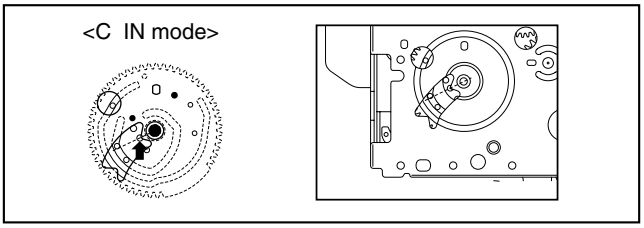


Fig. 2-3-4

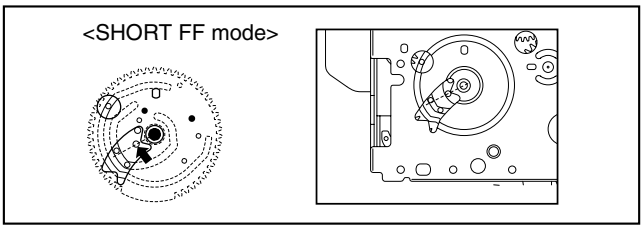


Fig. 2-3-5

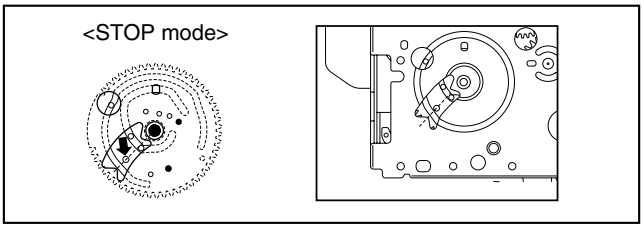


Fig. 2-3-6

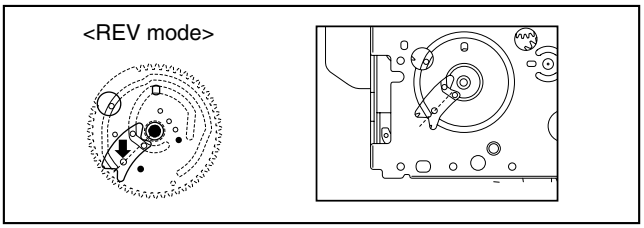


Fig. 2-3-7

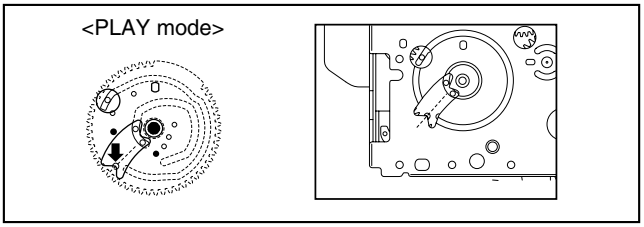


Fig. 2-3-8

2.3.3 Mechanism timing chart

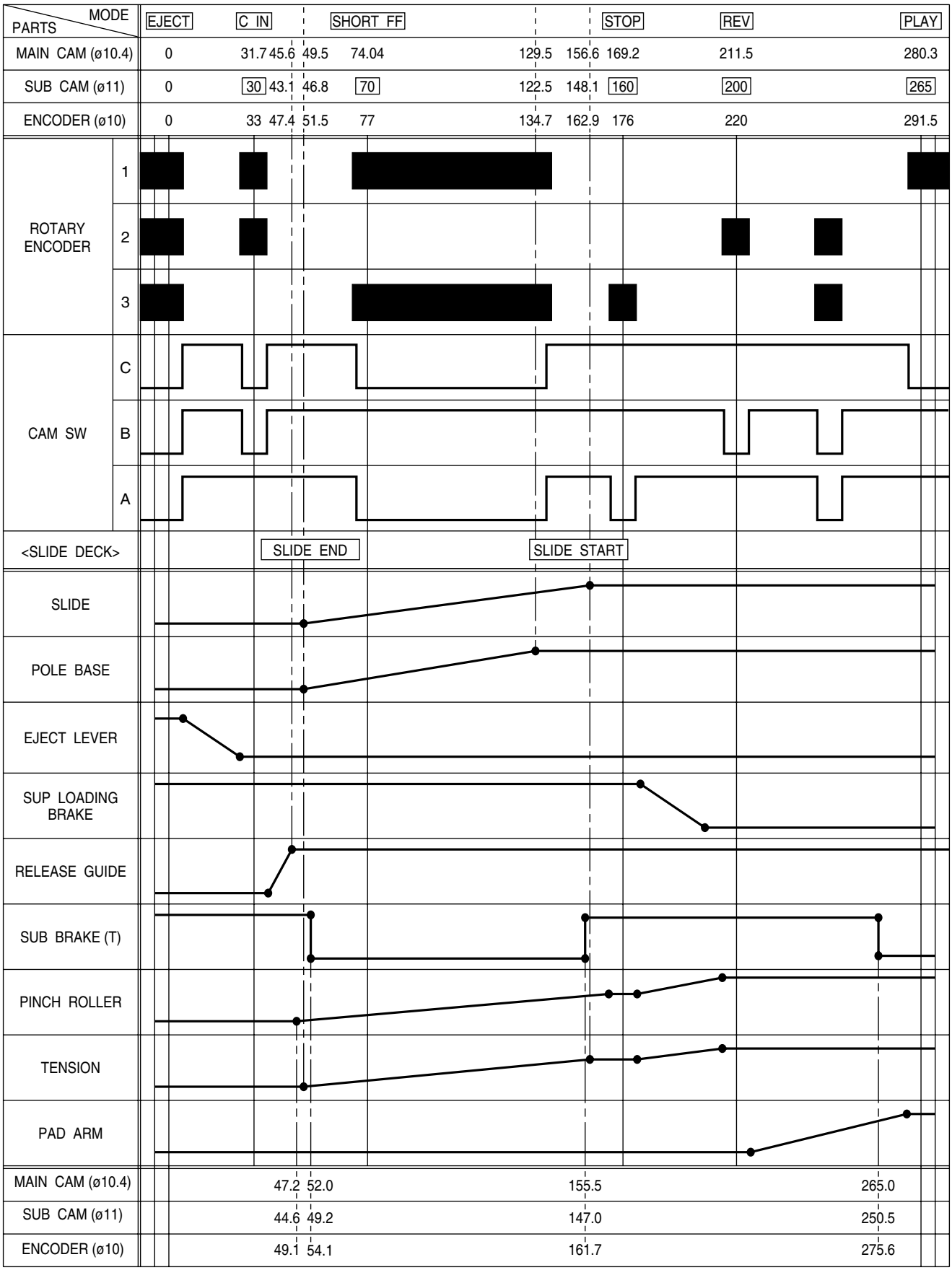


Table 2-3-1

2.4 DISASSEMBLY/ASSEMBLY OF MECHANISM ASSEMBLY

2.4.1 Follow chart

1. Configuration

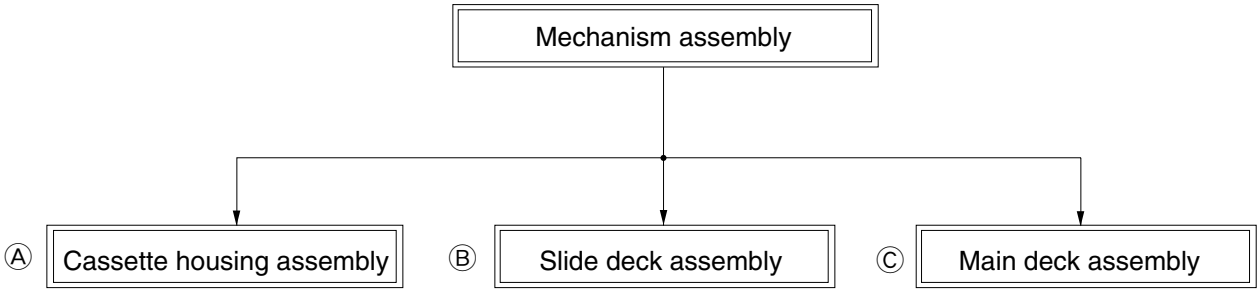


Fig. 2-4-1

2. Procedures for disassembly

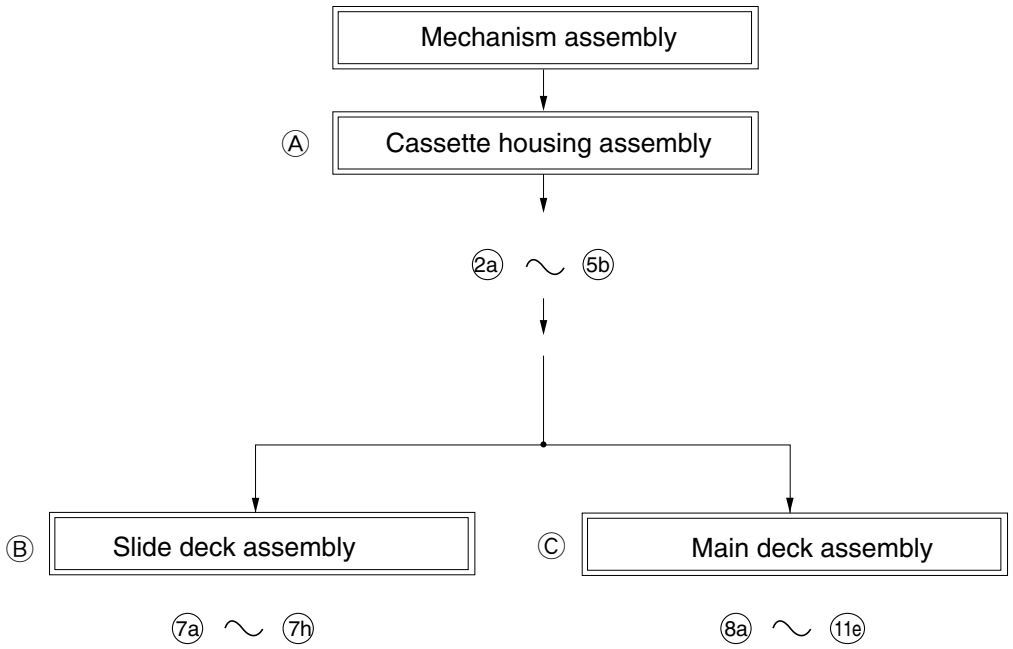


Fig. 2-4-2

3. Disassembling procedure table

NO.	PART NAME		FIG.	POINT	NOTE	REMARKS
Ⓐ	Cassette housing assembly	T	Fig. 2-4-5	3(S1),(L1a)-(L1d)	1a, 1b, 1c, 1d	Adjustment
2a	Reel disk (SUP) assembly	T	Fig. 2-4-6	(W2)	2a, 2b	
2b	Reel disk (TU) assembly	T		(W2)	2a, 2b	
2c	Reel cover assembly	T		2(S2a),(S2b),(W2)	2d	
3a	Tension arm assembly	T	Fig. 2-4-7	(W3a)	3b	
3b	Release guide assembly	T		-	3a	
3c	Idler arm assembly	T		(W3b)	-	
3d	Guide arm assembly	T		-	3a	
3e	Pinch roller arm assembly	T		(W3a)	-	
4a	Cleaner arm assembly	T	Fig. 2-4-8	(L4a)	4a	
4b	Slant pole arm assembly	T		(W4),(L4b),(P4a),(P4b)	4b	
4c	Drum assembly	T		3(S4)	-	
5a	Guide roller (S) assembly	T	Fig. 2-4-9	(P5)	5a, 5b	
5b	Rail assembly	T		3(W5a), (W5b)	5c	
Ⓑ	Slide deck assembly / Ⓒ Main deck assembly	T	Fig. 2-4-10	(W6),(L6a)-(L6d)	6a, 6b	(Adjustment)
Ⓑ	Slide deck assembly					
7a	Loading brake assembly	T	Fig. 2-4-11	(W7),(L7a),(P7a)	7e	
7b	Guide pin (S)	T		(S7a)	-	
7c	Pad arm assembly	T		(W7),(L7b),(P7b)	7d	Adjustment
7d	Slide guide plate assembly	T		(S7b)	7c	Adjustment
7e	Collar	T		-	7a	
7f	Collar	T		-	7a	
7g	Sub brake assembly	T		(W7),(L7c),(P7c)	7b	
7h	Control plate assembly	T		2(W7),(L7d),(P7d)	7b	
Ⓒ	Main deck assembly					
8a	Tension lever assembly	T	Fig. 2-4-12	-	8c	
8b	Slide lever assembly	T		-	8b	
8c	Brake control lever assembly	T		-	8a	
9a	Loading guide	T	Fig. 2-4-13	(S9)	-	
9b	Timing belt	T		-	9b	
9c	Center gear assembly	T		-	-	
9d	Motor bracket assembly	T		2(S9)	9a	
9e	Worm wheel	T		(W9)	-	(Phase adjustment)
9f	Gear holder	T		(S9)	-	
10a	Main cam gear	T	Fig. 2-4-14	(S10)	10b	Phase adjustment
10b	Brake control plate	T		(L10)	10b	Phase adjustment
10c	Rotary encoder	T		(S10),(W10a)	10a	Phase adjustment
10d	Connect gear	T		(W10a)	-	(Phase adjustment)
10e	Reel drive pulley assembly	T		(W10b)	-	
11a	Catcher (T) assembly	T	Fig. 2-4-15	2(S11)	-	
11b	Capstan motor	T		2(S11)	-	
11c	Charge arm assembly	T		(W11)	11	
11d	Sub cam gear	T		(S11)	-	Phase adjustment
11e	PWB holder	B		2(S11)	-	

Table 2-4-1

< TOP VIEW >

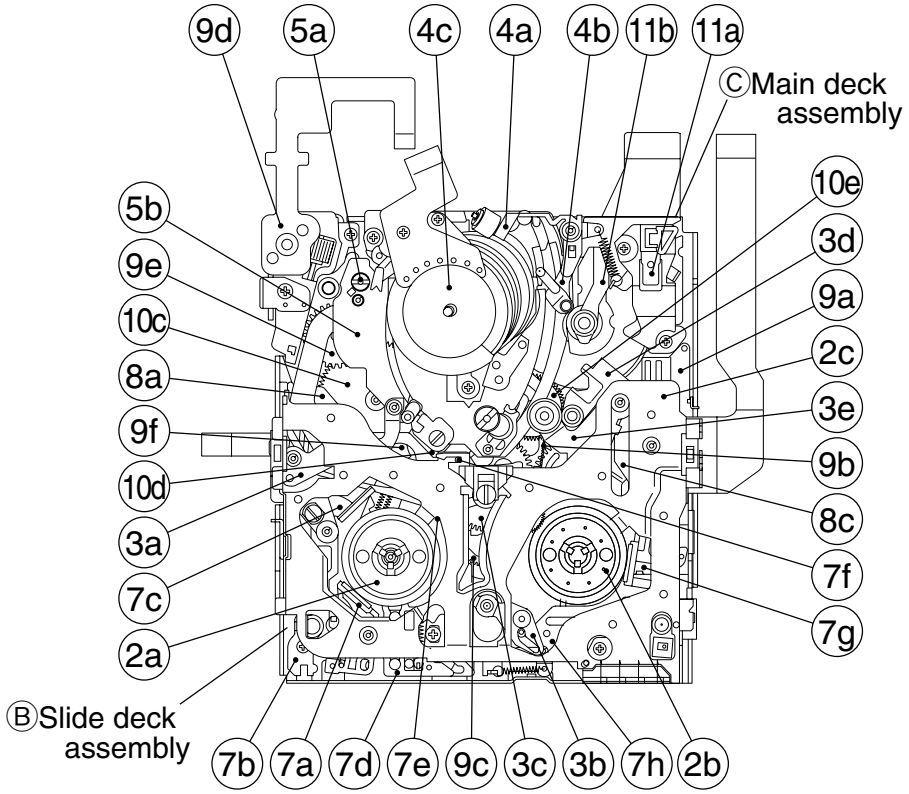


Fig. 2-4-3

< BOTTOM VIEW >

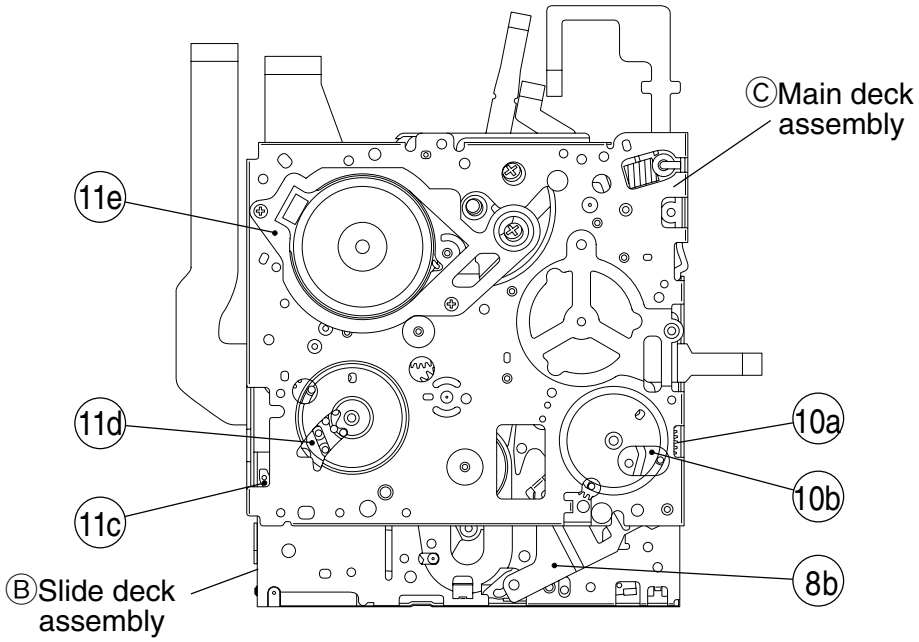


Fig. 2-4-4

2.4.2 Disassembly/assembly

1. Ⓐ Cassette housing assembly

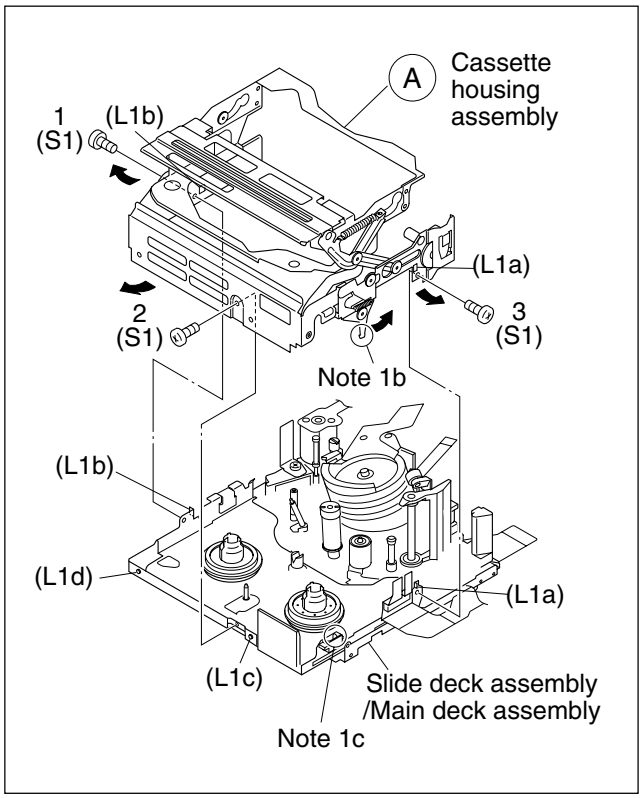
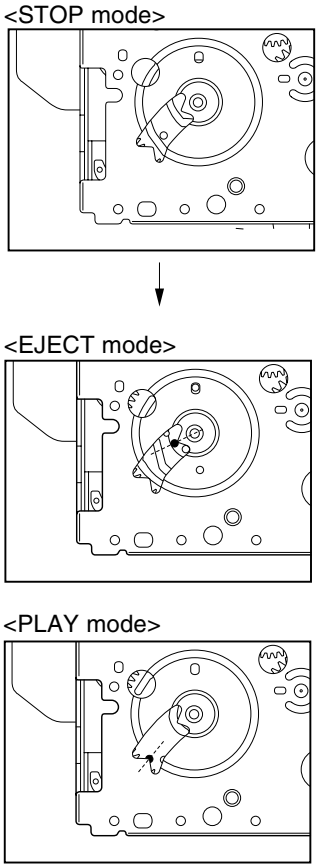


Fig. 2-4-5



Note 1a:
Shift the mechanism mode from the STOP mode to the EJECT mode.

Note 1b:
Reassemble the cassette housing assembly to the mechanism as the cancel lever is moved in the direction of the arrow.

Note 1c:
When reassembling the cassette housing to the mechanism, make sure that there is no deformation in the frame or no damage to the switches, etc.

Note 1d:
After reassembling the component parts, check the mechanism operation in the PLAY mode.
For details of checking method, refer to "2.6.1 assembling slide deck assembly and main deck assembly".

2. (2a) Reel disk (SUP) assembly
(2b) Reel disk (TU) assembly
(2c) Reel cover assembly

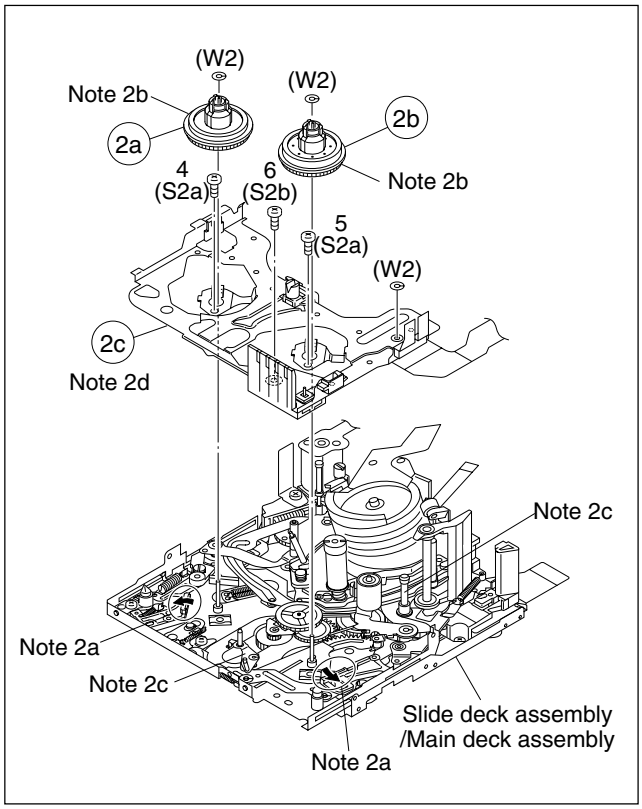
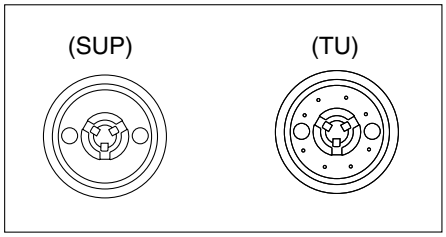


Fig. 2-4-6

Note 2a:
When removing the reel disk assembly, be careful not to break the brake pad which applies lateral pressure to the reel disk.

Note 2b:
Be careful not to make a mistake in installing the reel disk. The SUP reel disk and TU reel disk can be distinguished from each other by the appearance as shown below.



Note 2c:
When reassembling the cassette housing to the mechanism, make sure that there is no deformation in the frame or no damage to the switches, etc.

Note 2d:
When fitting the reel cover assembly to the set, carefully tighten the screw with the specified tightening torque of 0.069N•m (0.7kgf•cm).

3. (3a) Tension arm assembly/ (3b) Release guide assembly (3c) Idler arm assembly/ (3d) Guide arm assembly (3e) Pinch roller arm assembly

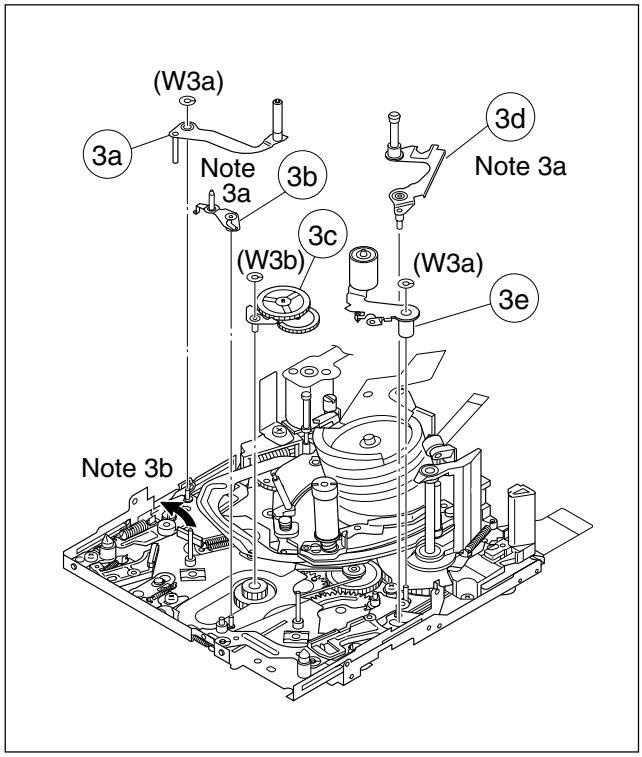
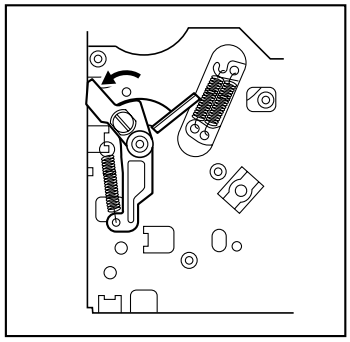


Fig. 2-4-7

Note 3a:
When removing the reel cover assembly, pay heed to release guide assembly and guide arm assembly. For, the guide arm assembly is just inserted into the slide deck assembly from the upside and it is apt to come off after the reel cover assembly is removed.

Note 3b:
Reassemble the tension arm assembly to the mechanism as the pad arm assembly is moved to the extent in the direction of the arrow.



4. (4a) Cleaner arm assembly/ (4b) Slant pole arm assembly (4c) Drum assembly

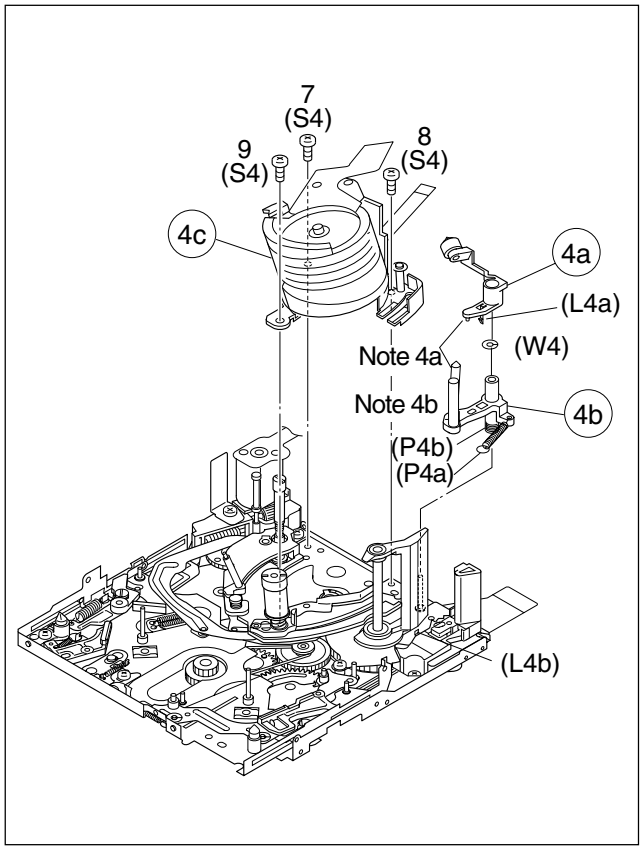
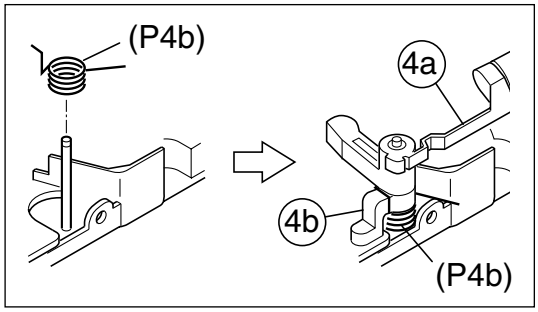


Fig. 2-4-8

Note 4a:
When removing the cleaner arm assembly, it is recommended to remove the slant pole arm assembly together with it except the case of a single unit replacement, because the hook (L4a) is hard to disengage.

Note 4b:
How to set the coil spring (P4b).



5. (5a) Guide roller (S) assembly/ (5b) Rail assembly

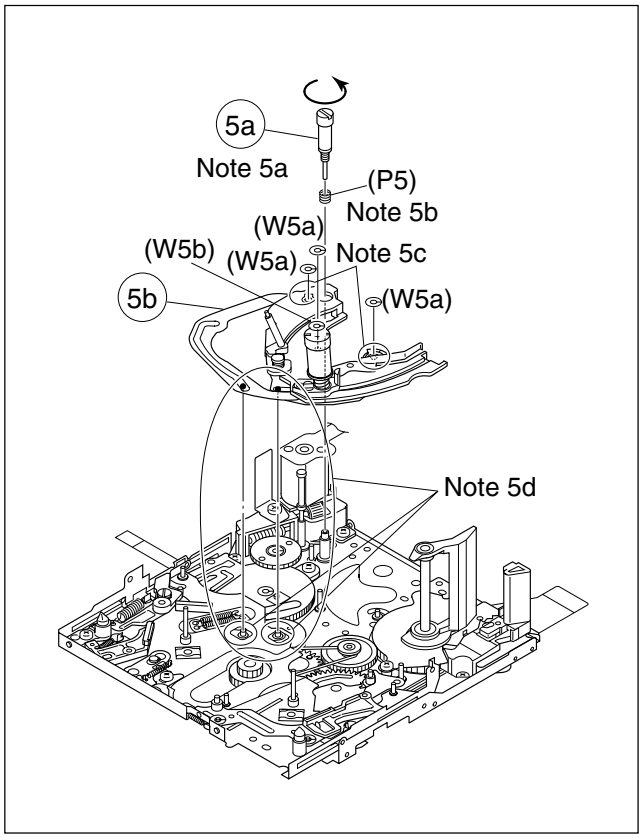
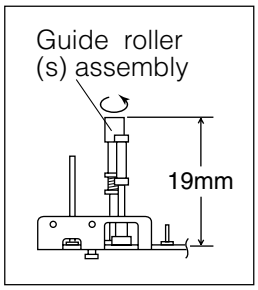


Fig. 2-4-9

Note 5a:
When reassembling, insert the tip of the guide roller with the coil spring put on it into the hole on the main deck. Tighten the guide roller by about 6 turns so that the height of the guide roller assembly is 19 mm or so as shown in the figure.



Note 5b:
Pay careful attention to the spring not to lose it.

Note 5c:
Pay careful attention to the engagement of the rail assembly's arm ends because they easily come off the engagement. Moreover, make sure that there is neither deformation nor damage observed in them.

Note 5d:
When removing the rail assembly, check to see if the collar is securely set in the arm groove.

6. (B) Slide deck assembly/ (C) Main deck assembly

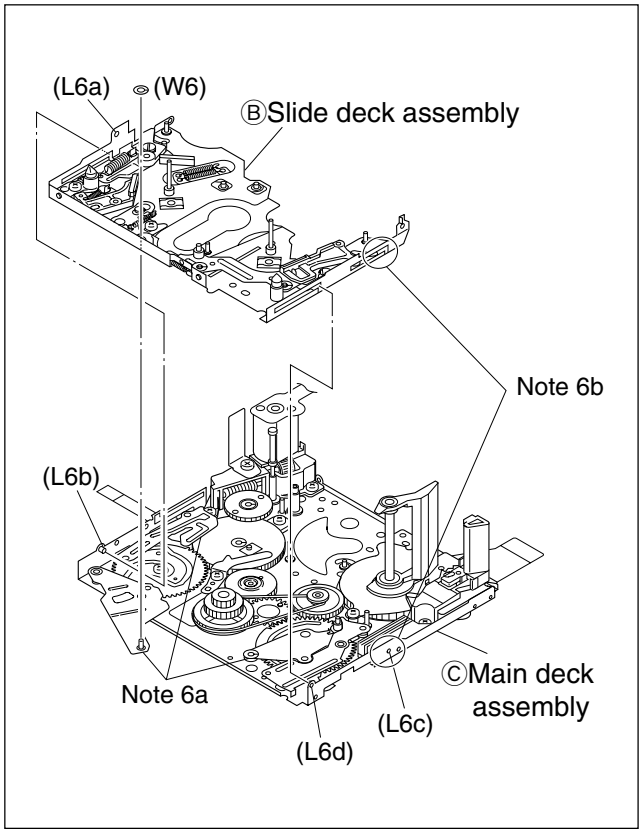
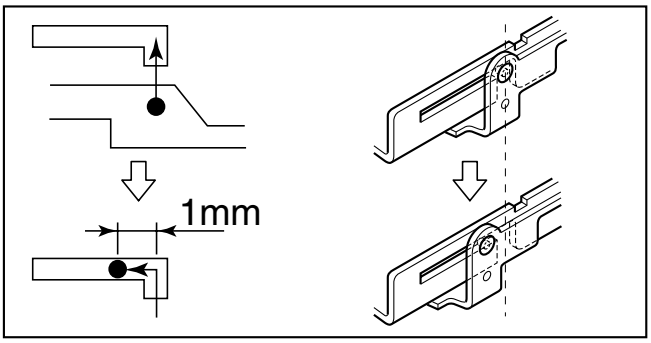


Fig. 2-4-10

Note 6a:
When removing the slide deck assembly, pay heed to the three components of the following because they are apt to come off after the slide deck assembly is removed.

(8a) Tension lever assembly/ (8b) Slide lever assembly
(8c) Brake control lever assembly
For reassembling those components, refer to Fig. 2-4-12.

Note 6b:
When reassembling the slide deck assembly to the main deck assembly, combine them with each other by the side grooves and then slide the slide deck assembly by 1 mm or so.



7. (7a) Loading brake assembly/ (7b) Guide pin (S)
(7c) Pad arm assembly/ (7d) Slide guide plate assembly
(7e) Collar/ (7f) Collar/ (7g) Sub brake assembly
(7h) Control plate assembly

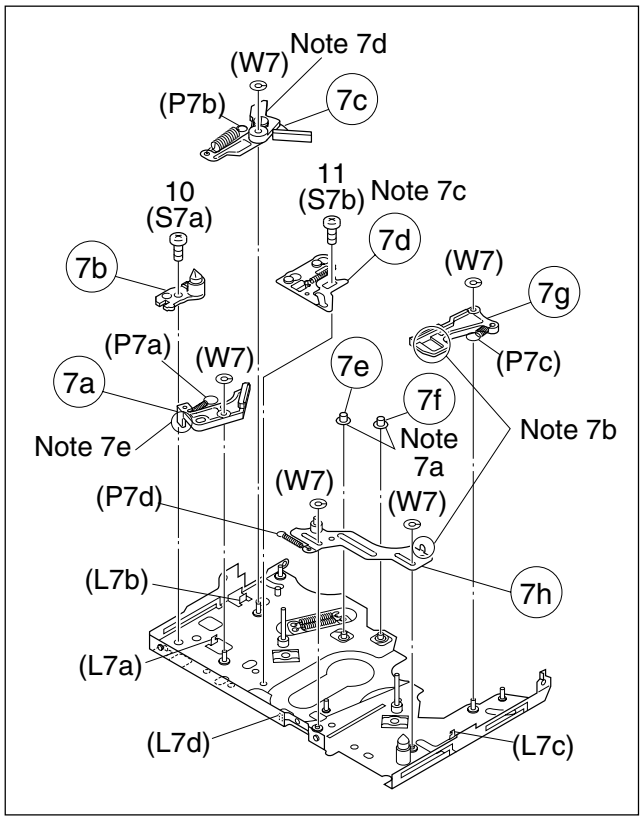


Fig. 2-4-11

8. (8a) Tension lever assembly/ (8b) Slide lever assembly
(8c) Brake control lever assembly

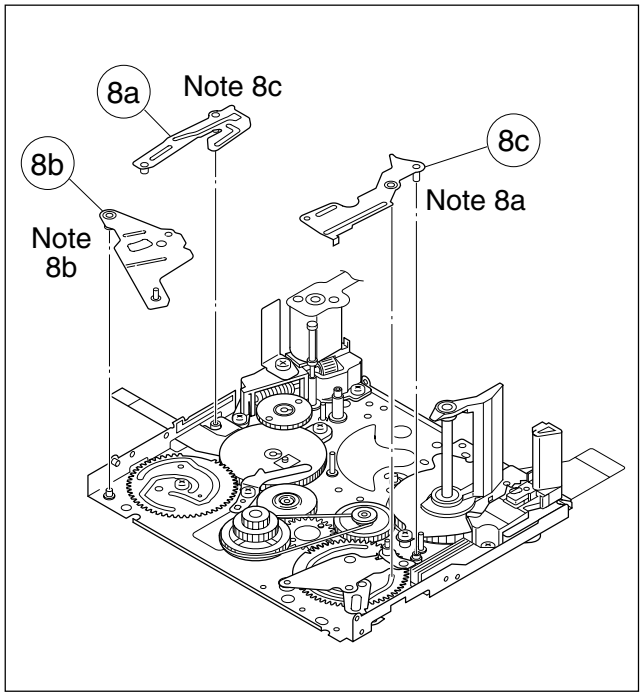
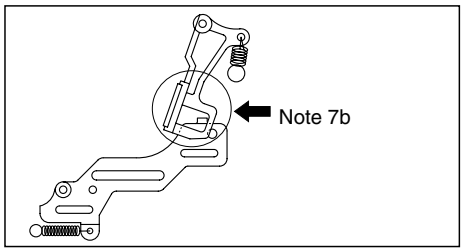


Fig. 2-4-12

Note 7a:
Don't remove these parts unreasonably. If they are removed for some reason, be very careful not to lose them.

Note 7b:
When reinstalling the sub brake assembly, set the control plate assembly so that its hook is set in the □ part of the sub brake assembly.



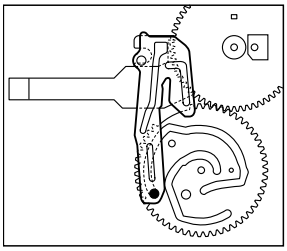
Note 7c:
Since the slide guide plate assembly controls the slide deck assembly so that it exactly slides the main deck assembly, it must exactly be assembled in the PLAY mode. Therefore, temporarily fix the slide guide plate assembly in this stage. For details of reassembling procedure, refer to "2.6.1 Assembling slide deck assembly and main deck assembly" .

Note 7d:
The pad arm assembly controls the tension level of the tension arm assembly. For adjustment of the tension arm assembly, refer to "2.6.2 Locating tension pole".

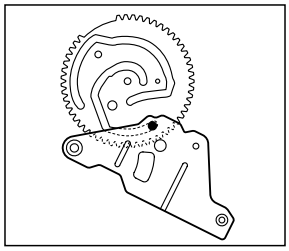
Note 7e:
When reinstalling the loading brake assembly, slightly lift the slide deck assembly upwards because the lower part of the loading brake assembly sticks out of the slide deck assembly.

Note 8a, 8b, 8c:
For refitting the respective parts, refer to the following figures

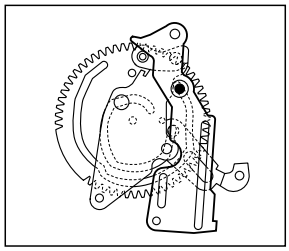
(8a) Tension lever assembly



(8b) Slide lever assembly



(8c) Brake control lever assembly



9. (9a) **Loading guide/** (9b) **Timing belt**
(9c) **Center gear assembly/** (9d) **Motor bracket assembly**
(9e) **Worm wheel/** (9f) **Gear holder**

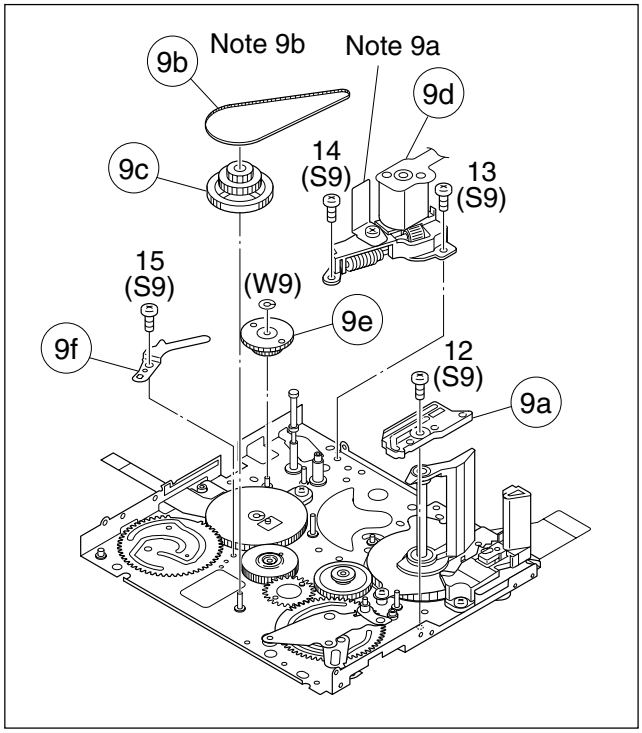


Fig. 2-4-13

Note 9a:
Carefully handle the DEW sensor. (Don't touch the sensor surface in particular.)

Note 9b:
When engaging the timing belt, make sure that it securely engages with the gears of both the center gear assembly and reel drive pulley assembly.

10. (10a) **Main cam gear/** (10b) **Brake control plate**
(10c) **Rotary encoder/** (10d) **Connect gear**
(10e) **Reel drive pulley assembly**

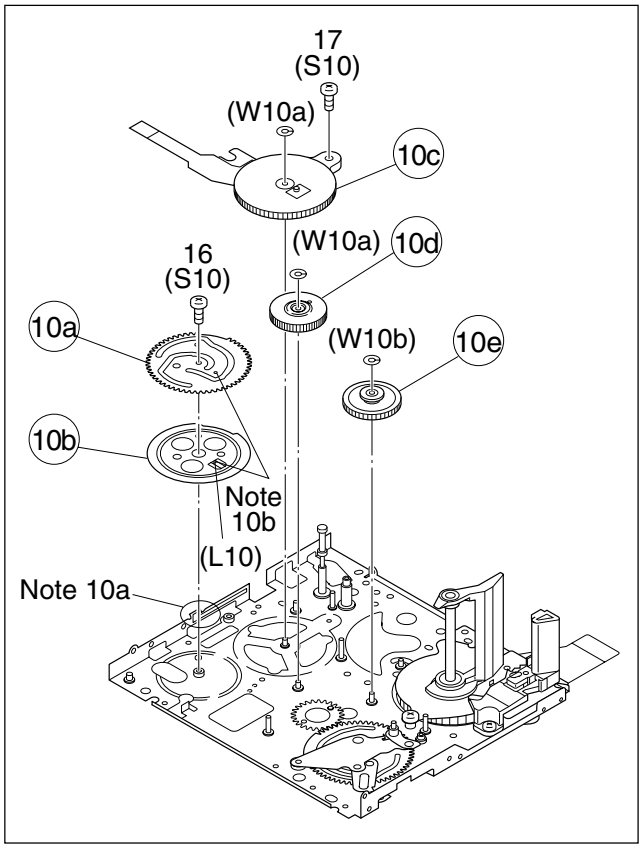
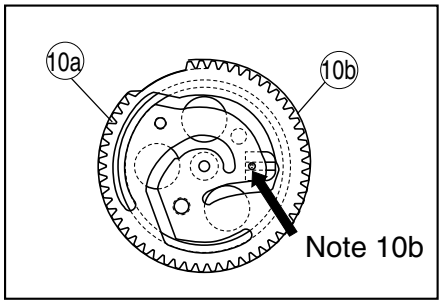


Fig. 2-4-14

Note 10a:
When removing/refitting parts, pay careful attention to the flexible board and so on not to damage them.

Note 10b:
When reinstalling the main cam gear and the brake control plate, first fit them together so that the protrusion on the brake control plate is set in the slot on the main cam gear as shown below, next install the two together to the main deck assembly.



11. (11a) Catcher (T) assembly/ (11b) Capstan motor
(11c) Charge arm assembly/ (11d) Sub cam gear
(11e) PWB holder

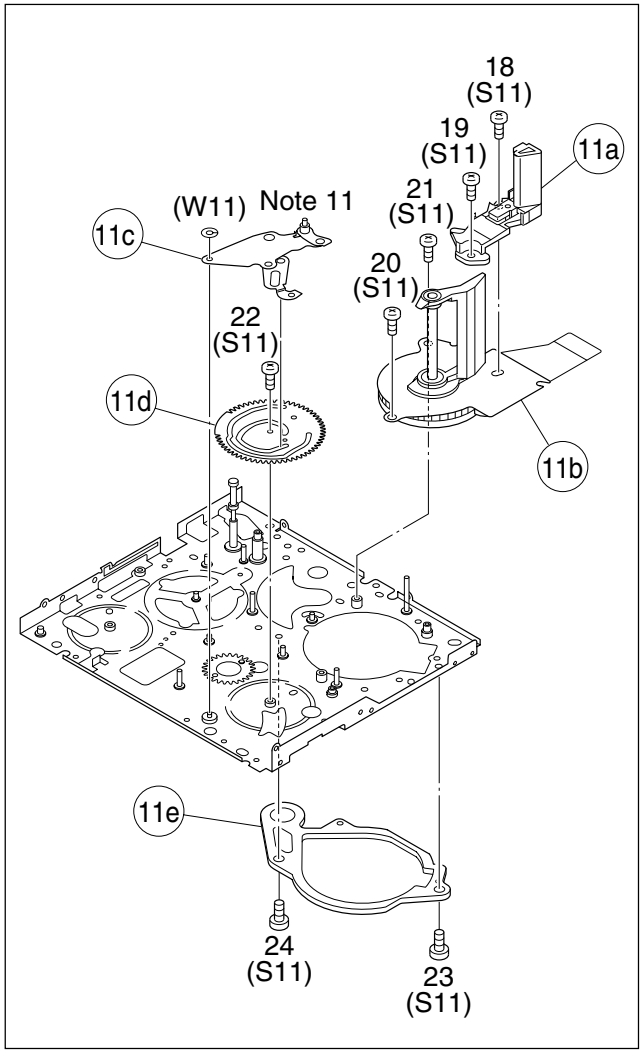
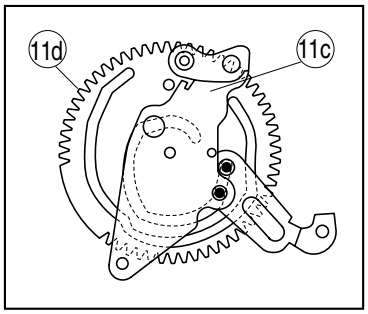
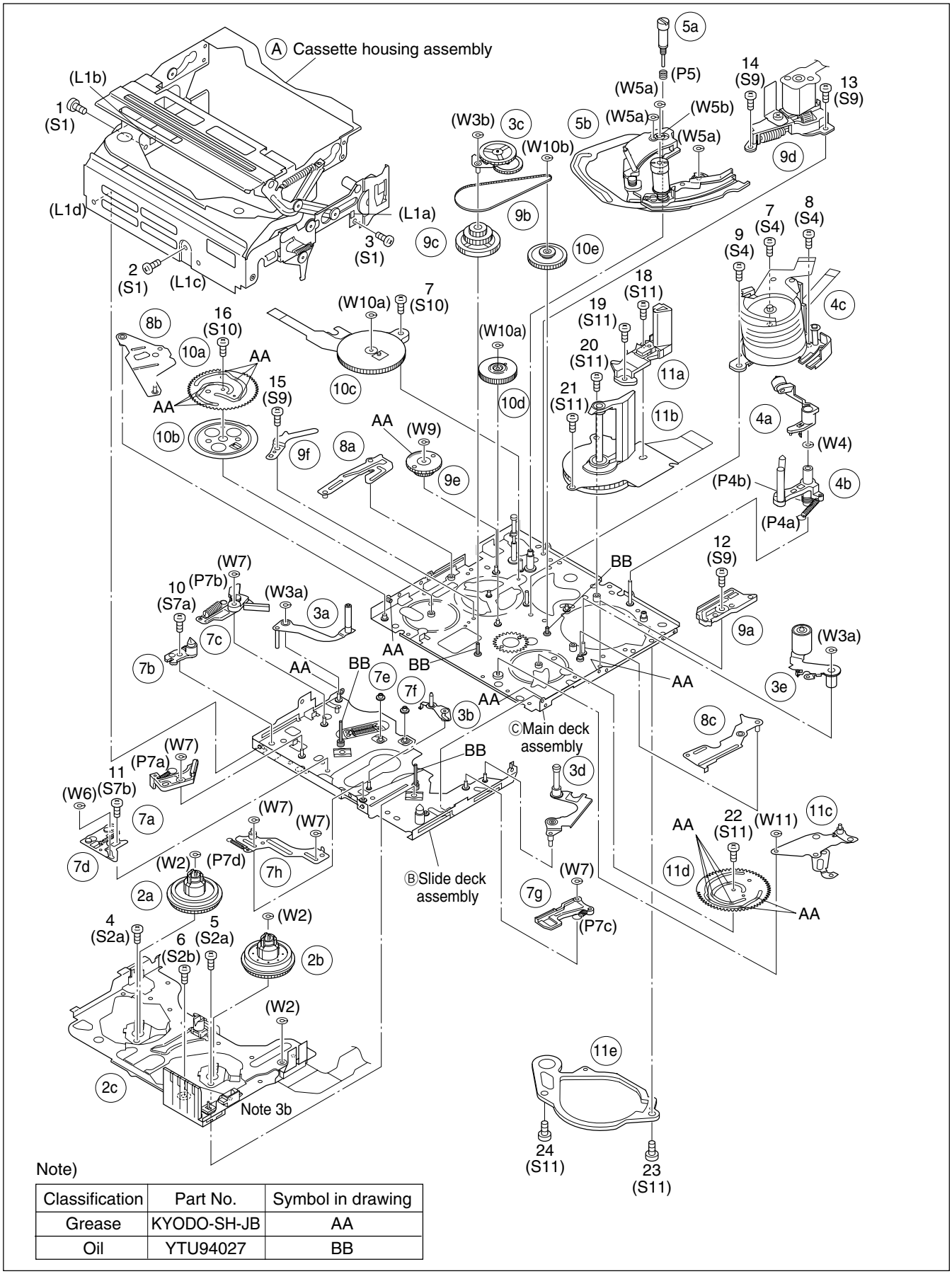


Fig. 2-4-15

Note 11:
The following figure shows how to put the charge arm assembly and sub cam gear assembly together.



2.4.3 List of procedures for disassembly

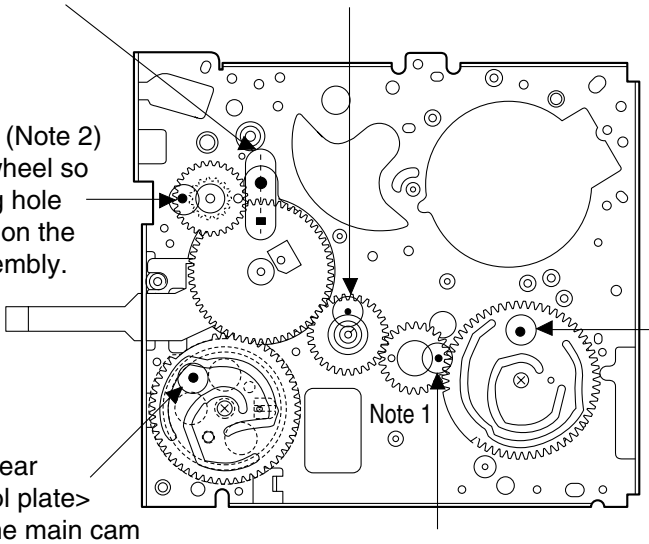


Note)

Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-JB	AA
Oil	YTU94027	BB

Fig. 2-4-16

2.5 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE



<Rotary encoder>
Set the "■" of the rotary part at the tapped hole as shown in the figure.

<Connect gear> (Note 2)
Set the connect gear so that its locating hole meets the hole on the main deck assembly.

<Worm wheel> (Note 2)
Set the worm wheel so that its locating hole meets the hole on the main deck assembly.

<Sub cam gear>
Set the sub cam gear so that its locating hole meets the hole on the main deck assembly. This state represents that the mechanism is in the EJECT mode, which is the "mechanism assembly mode".

<Main cam gear /Brake control plate>
After fitting the main cam gear and brake control plat together,set them together so that their locating holes meet the hole on the main deck assembly.

<Connect gear 2> (Note 2)
Set the connect gear 2 so that its locating hole meets the hole on the main deck assembly.

Note 1:
Since the connect gear 2 is tightly fixed to the main deck by caulking, adjust its phase with the connect gear and sub cam gear.

Note 2:
The part that needs phase adjustment by the hole on the main deck assembly must exactly be set as the specified phase. There is a fear that some part is installed in a wrong phase because assembling of the mechanism is automated. If so, set every part in the correct phase whenever the mechanism is reassembled.

Fig. 2-5-1

2.6 MECHANISM ADJUSTMENTS

2.6.1 Assembling slide deck assembly and main deck assembly

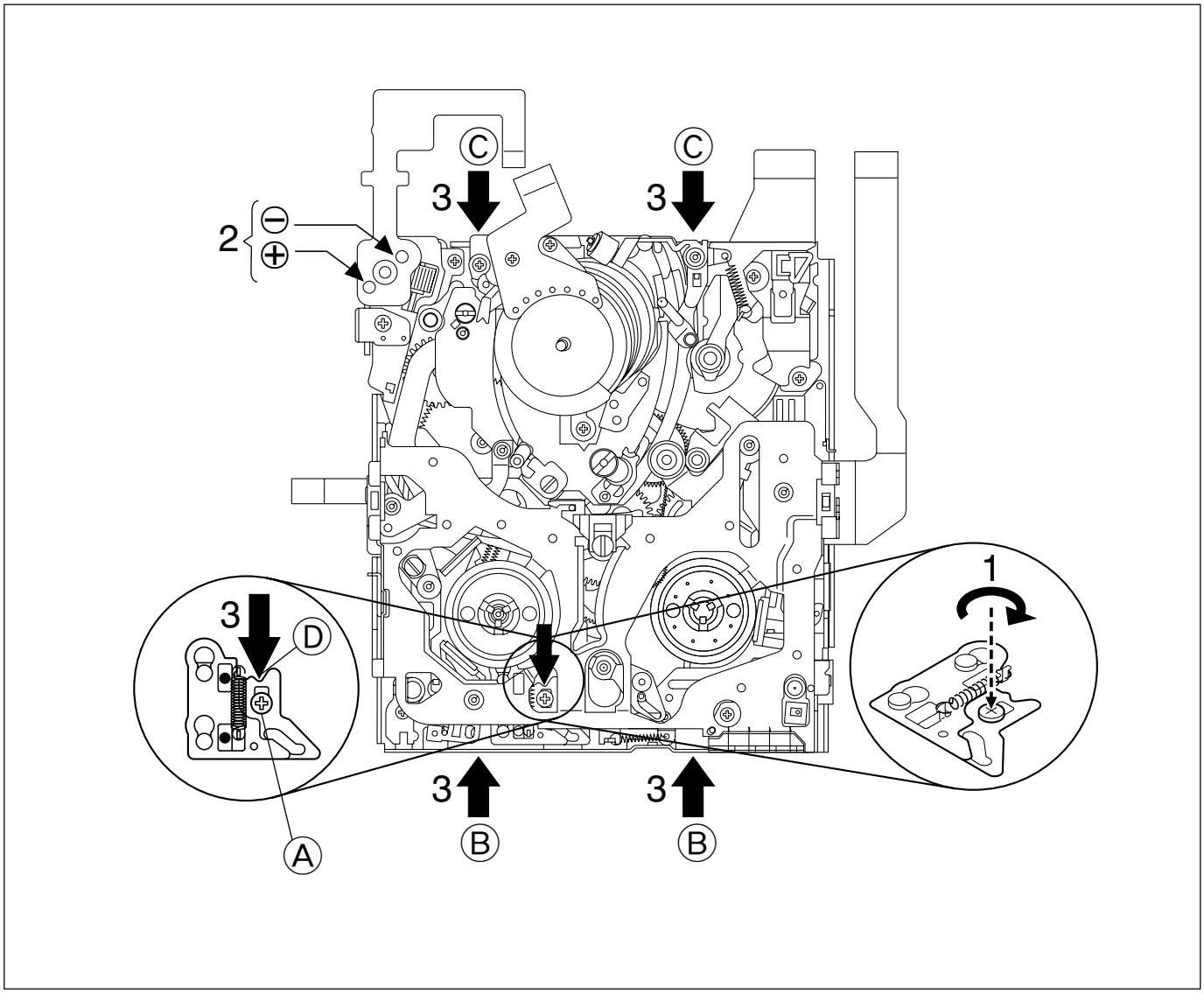


Fig. 2-6-1

Assembling procedure

1. Loosen the screw Ⓐ.
2. Set the mechanism in the PLAY mode.
   (Refer to “2.3.2 Explanation of mechanism mode”.)
3. Press the end face Ⓑ of the slide deck assembly (reel disk side) and the end face Ⓒ of the main deck assembly (drum assembly side) with uniform force so that the two assemblies are tightly pressed to each other. Furthermore, press the part Ⓓ and tighten the screw Ⓐ.

Note : *Tightening torque for screw Ⓐ: 0.069 N·m (0.7 kgf·cm)*

2.6.2 Locating tension pole

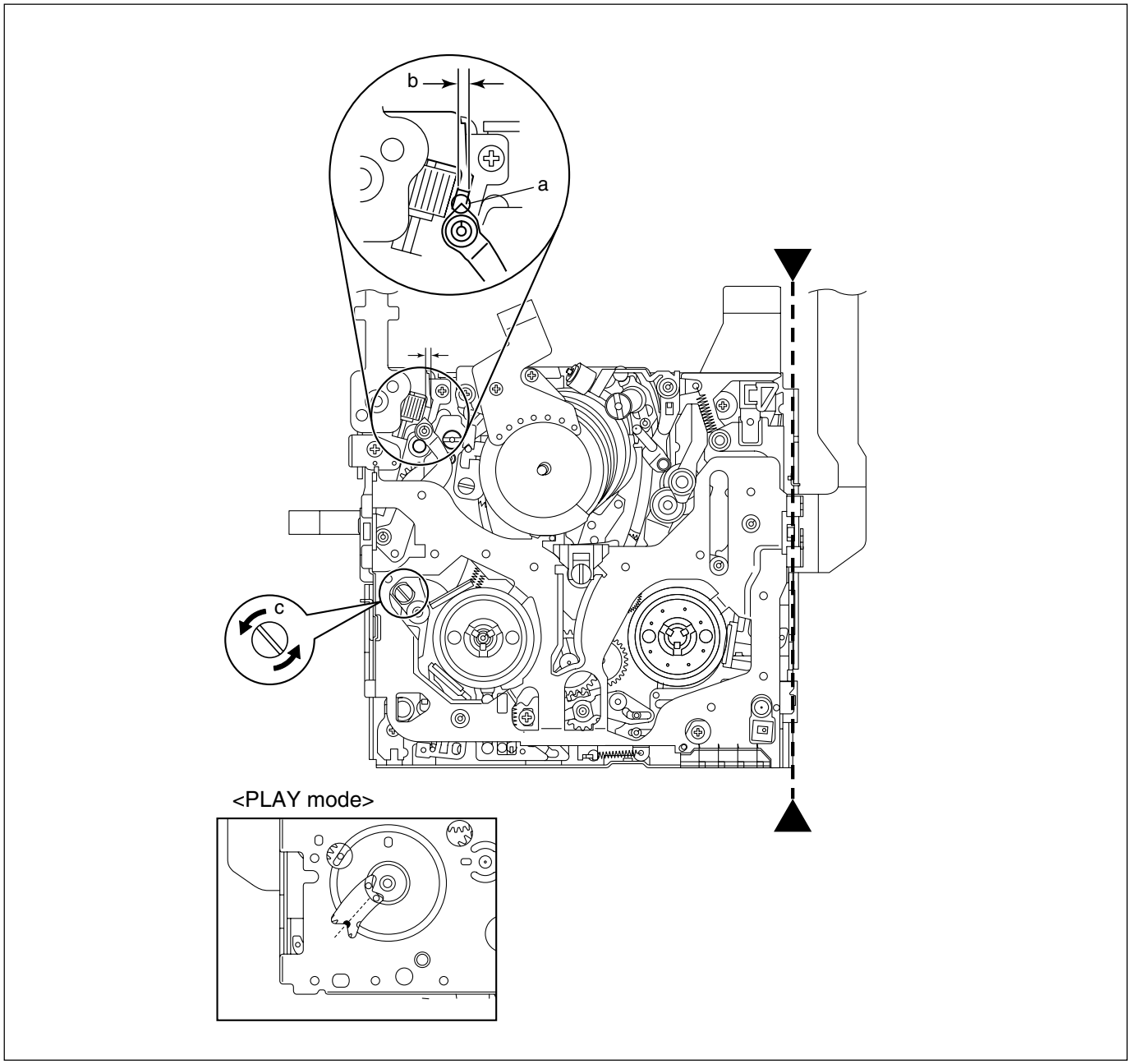


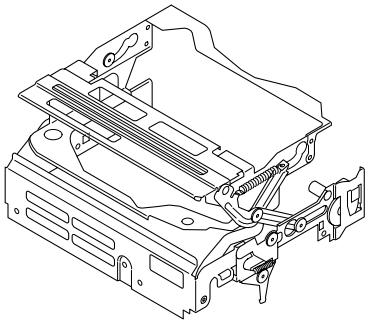
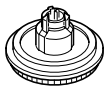
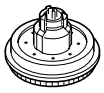
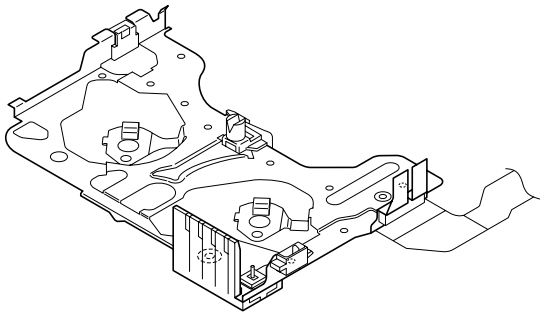
Fig. 2-6-2

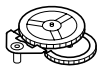
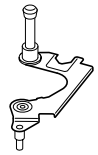
Locating procedure

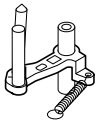
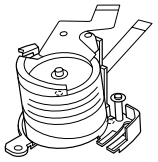
1. Enter the mechanism assembly into the PLAY mode. (Refer to “2.3.2 Explanation of mechanism mode”.)
2. When the “ ▶-----◀ ” part is positioned down, make sure that the part “a” of the tension arm assembly is located within the range of “b”.
3. If the part “a” is out of the range, turn the pin “c” to adjust the position.

2.7 SERVICE NOTE

Use the following chart to manage mechanism parts that are removed for disassembling the mechanism.

<table>
<tr><td>1</td><td colspan="5">(A) Cassette housing assembly
 
S1×3</td></tr>
<tr><td>2</td><td colspan="2">(2a) Reel disk (SUP) assembly
 
W2×1
(2b) Reel disk (TU) assembly
 
W2×1</td><td colspan="3">(2c) Reel cover assembly
 
S2a×2 S2b×1 W2×1</td></tr>
<tr><td>3</td><td>(3a) Tension arm assembly

W3a×1</td><td>(3b) Release guide assembly
 </td><td>(3c) Idler arm assembly
 
W3b×1</td><td>(3d) Guide arm assembly
  </td><td>(3e) Pinch roller arm assembly

W3a×1</td></tr>
<tr><td>4</td><td>(4a) Cleaner arm assembly
 </td><td colspan="2">(4b) Slant pole arm assembly
 
W4×1 P4a×1 P4b×1</td><td colspan="2">(4c) Drum assembly
 
S4×3</td></tr>
<tr><td>5</td><td>(5a) Guide roller (S) assembly

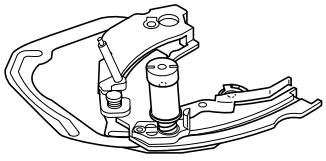
P5×1</td><td colspan="3">(5b) Rail assembly
 
W5a×3 W5b×1</td></tr>
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Table 2-7-1a

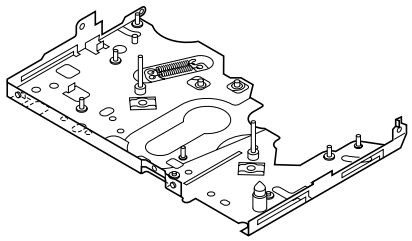
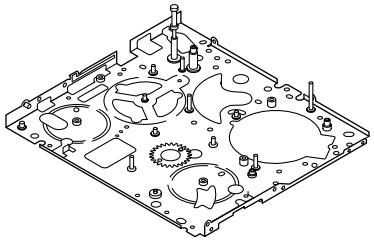
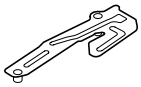
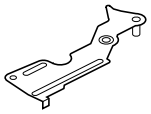
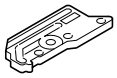
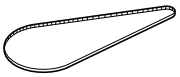
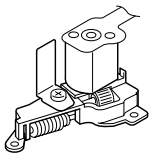
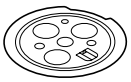
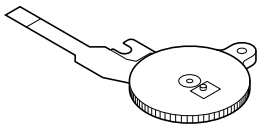
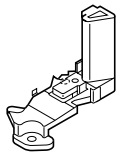
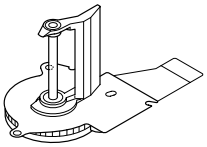
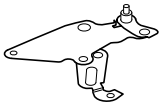
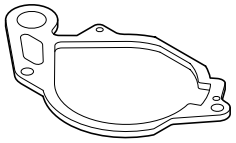
6	B Slide deck assembly  W6×1	7	7a Loading brake assembly W7×1 P7a×1	7b Guide pin (S) S7a×1	7c Pad arm assembly W7×1 P7b×1
			7e Collar 	7f Collar 	7g Sub brake assembly W7×1 P7c×1
8	C Main deck assembly 		8a Tension lever assembly 	8b Slide lever assembly 	8c Brake control lever assembly 
9	9a Loading guide  S9×1	9b Timing belt 	9c Center gear assembly 	9d Motor bracket assembly  S9×2	9e Worm wheel W9×1	9f Gear holder S9×1
10	10a Main cam gear S10×1	10b Brake control plate 	10c Rotary encoder  S10×1 W10a×1	10d Connect gear W10a×1	10e Reel drive pulley assembly W10b×1	
11	11a Catcher (T) assembly  S11×2	11b Capstan motor  S11×2	11c Charge arm assembly  W11×1	11d Sub cam gear S11×1	11e PWB holder  S11×2	

Table 2-7-1b

2.8 COMPATIBILITY ADJUSTMENT

2.8.1 Jig connector cable connection

Remove one screw (1) first and the cover (JIG) next.

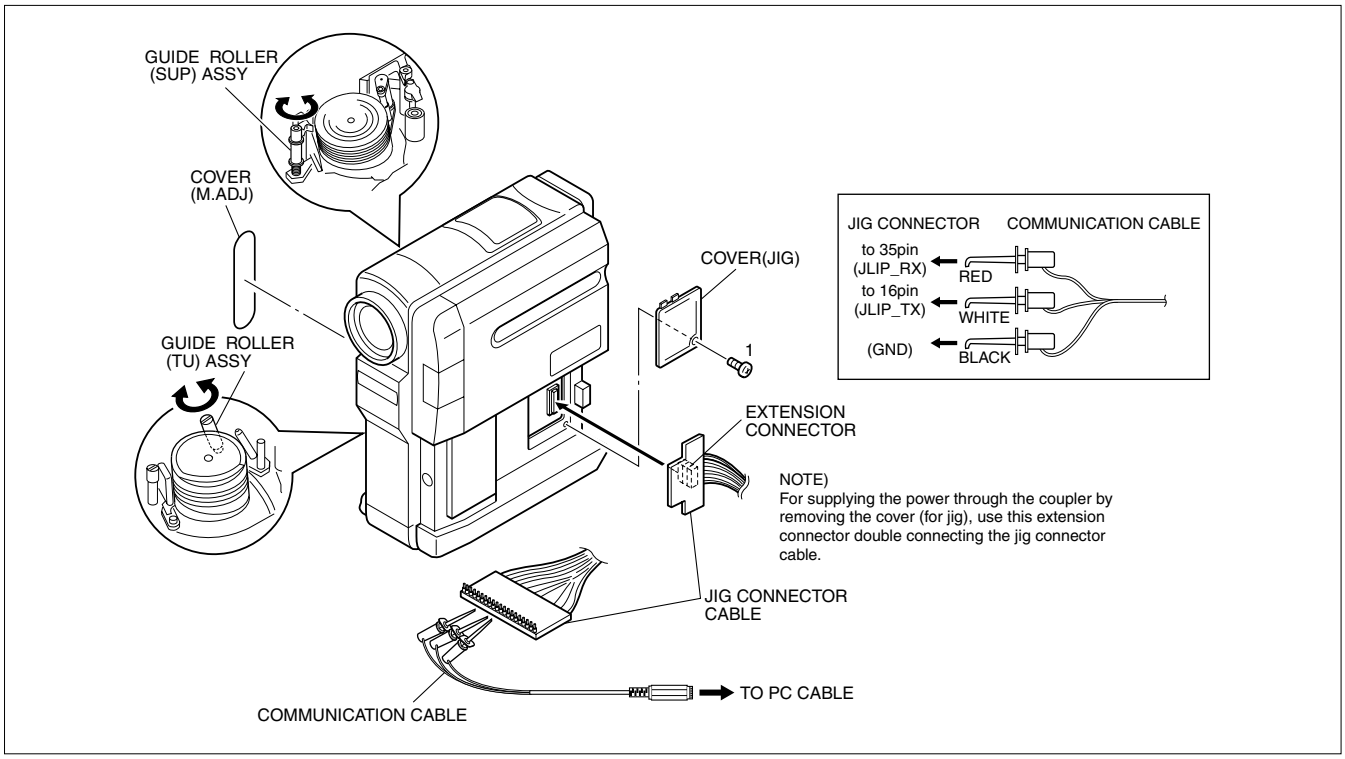


Fig. 2-8-1

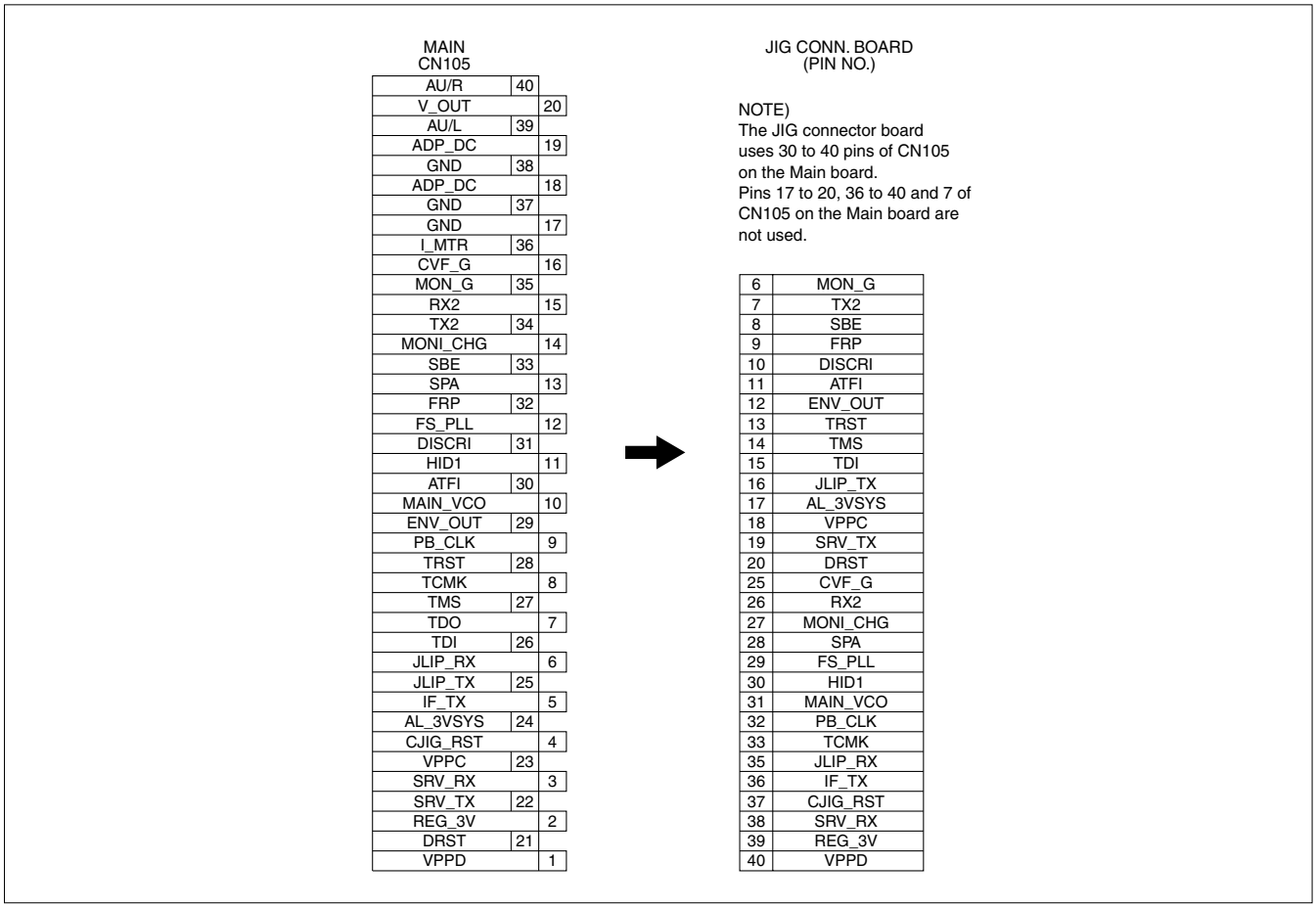


Fig. 2-8-2

2.8.2 Tape pattern check

(1) Play back the compatibility adjustment tape.

(2) While triggering the MAIN CN105-11PIN (HID1), observe the waveform of CN105-29PIN (ENV_OUT).

(3) Confirm that the waveform is free from remarkable level-down, and entirely parallel and straight.
Moreover, perform the following adjustment as required.

(4) In case any level-down is observed on the left hand side, straighten the level by turning the guide roller of the pole base assembly (supply).
In case any level-down is observed on the right hand side, however, straighten the level by turning the guide roller of the pole base assembly (Take-up).

(5) After adjustment, try the unloading motion once, and confirm that the waveform is flat (straight) when the tape has been played back again.
Moreover, perform readjustment as required.

(6) When the recording has been played back again, play back the self-recording to confirm that the waveform is flat.

Note:
When an adjustment is performed with the lower case cover attached, first slide the Cover (M.ADJ) open and then perform the compatibility adjustment.
Be sure not to damage the cover plate when sliding it open to make an adjustment because it must be re-positioned after completing the adjustment.

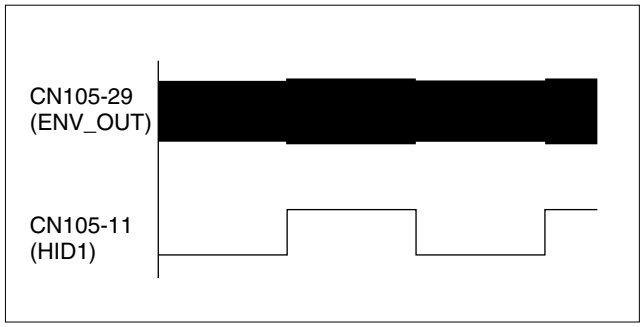


Fig. 2-8-3

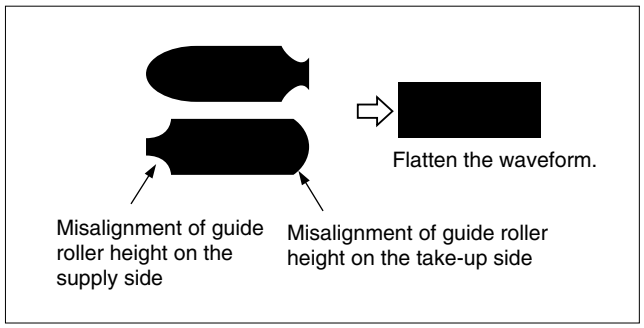

Flatten the waveform.
Misalignment of guide roller height on the supply side
Misalignment of guide roller height on the take-up side

Fig. 2-8-4

SECTION 3
ELECTRICAL ADJUSTMENT

3.1 PRECAUTION

1. Precaution

Both the camera and deck sections of this model needs a personal computer for adjustment except simple adjustment with potentiometers. If some of the following parts is replaced for repair or other reason, the repaired set must be adjusted with a personal computer.

- OP block
- E^2PROM (IC1003 of MAIN board)
- E. VF
- MONITOR
- E^2PROM (IC7603 of MONITOR board)

In the event of malfunction with electrical circuits, trouble-shooting with the aid of proper test instruments most be done first, and then commence necessary repair, replacement and adjustment, etc.

1. In case of wiring to chip test points for measurement, use IC clips, etc. to avoid any stress.
2. Since connectors are fragile, carefully handle them in disconnecting and connecting.

2. Required test equipment

1. Color TV monitor.
2. Oscilloscope (dual-trace type, observable 100 MHz or higher frequency)
   Note : *It is recommended to use one observable 300 MHz or higher frequency.*
3. Digital voltmeter
4. Frequency counter (with threshold level adjuster)
5. Personal computer

3. Tools required for adjustments

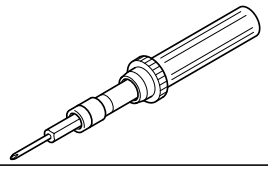
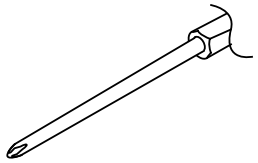
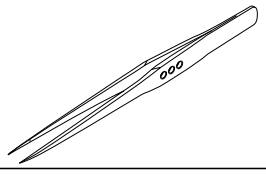
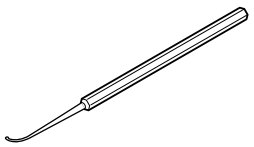
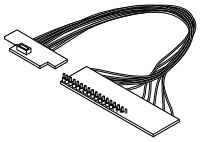
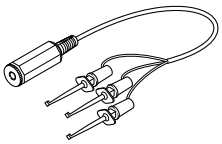
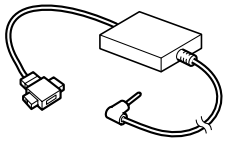
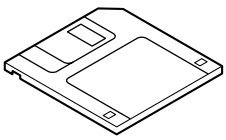
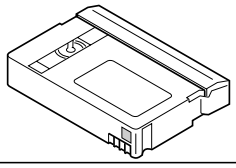
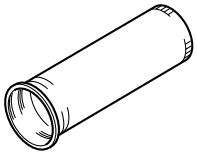
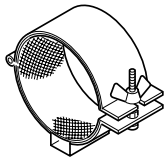
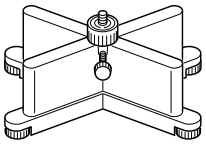
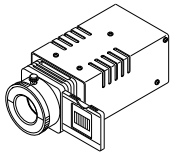
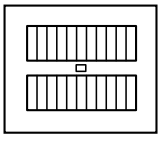
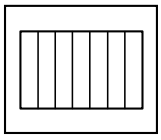
1 Torque driver YTU94088	2 Bit YTU94088-003
	
3 Tweezers P-895	4 Chip IC replacement jig PTS40844-2
	
5 Jig connector cable YTU93106C	6 Extension connector YTU94145D-40
	
7 Communication cable YTU93107A	8 PC cable QAM0099-002
	
9 Service support system YTU94057-59	10 Alignment tape MC-2
	
11 INF adjustment lens YTU92001B	12 INF adjustment lens holder YTU94087
	
13 Camera stand YTU93079	14 Light box assembly YTU93096A
	
15 Gray scale chart YTU94133A	16 Color bar chart YTU94133C
	

Table 3-1-1

1. Torque driver
Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.

2. Bit
This bit is slightly longer than those set in conventional torque drivers.

3. Tweezers
To be used for removing and installing parts and wires.

4. Chip IC replacement jig
To be used for adjustment of the camera system.

5. Jig connector cable
Connected to CN105 of the main board and used for electrical adjustment, etc.

6. Extension connector
Connect this extension connector to the connector of the jig connector cable for extending the cable connector.

Note: *For supplying the power through the coupler by removing the cover (for jig), use this extension connector double for connecting the jig connector cable.*

7. Communication cable
Connect the Communication cable between the PC cable and Jig connector cable when performing a PC adjustment.

8. PC cable
To be used to connect the VideoMovie and a personal computer with each other when a personal computer is used for adjustment.

9. Service support system
To be used for adjustment with a personal computer.

10. Alignment tape
To be used for check and adjustment of interchangeability of the mechanism.

11. INF adjustment lens
To be used for adjustment of the camera system.

12. INF adjustment lens holder
To be used together with the camera stand for operating the VideoMovie in the stripped-down condition such as the status without the exterior parts or for using commodities that are not yet conformable to the interchangeable ring.

13. Camera stand
To be used together with the INF adjustment lens holder.

14. Light box assembly
To be used for adjustment of the camera system.

15. Gray scale chart (for Light box assembly)
To be used for adjustment of the camera system.

16. Color bar chart (for Light box assembly)
To be used for adjustment of the camera system.

3.2 SETUP

1. Setup for electrical adjustment with personal computer.

NOTE: *Remove one screw (1) first and the cover (JIG) next.*

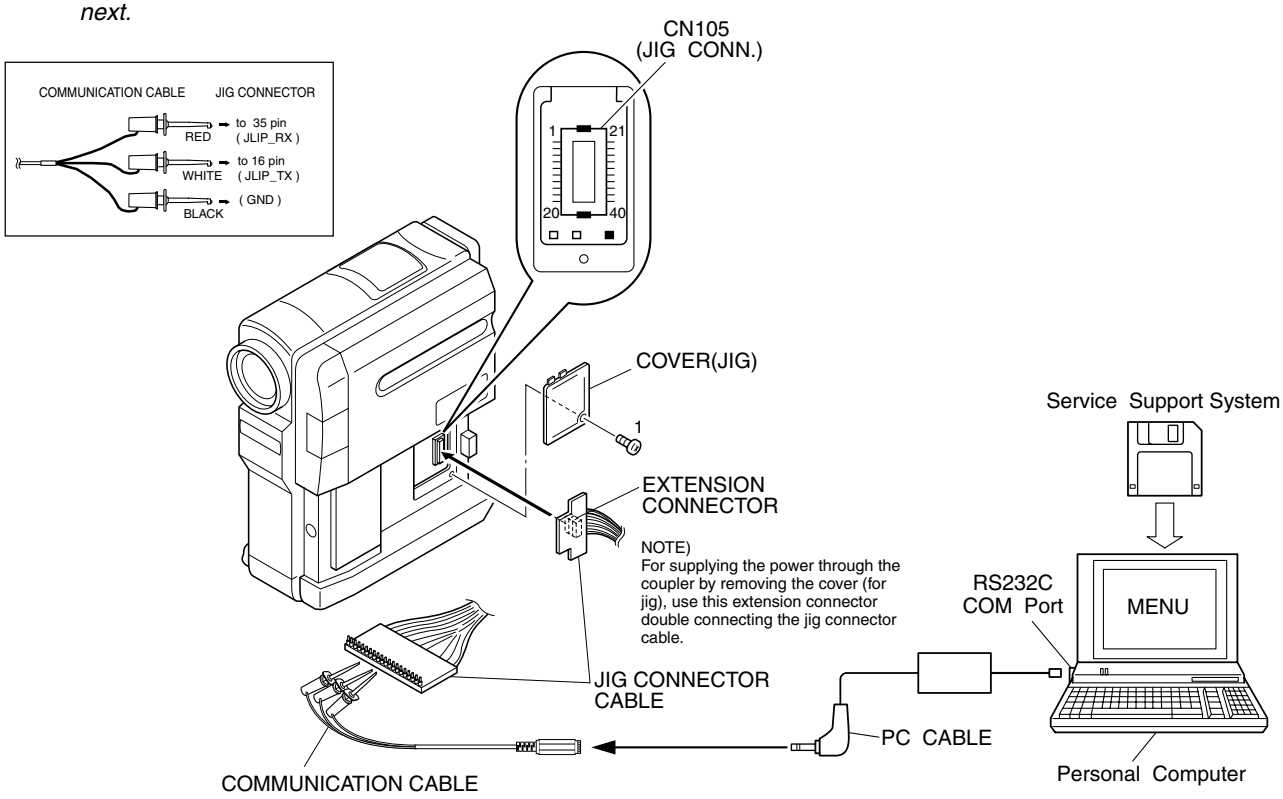


Fig. 3-2-1 Connection for Service support system